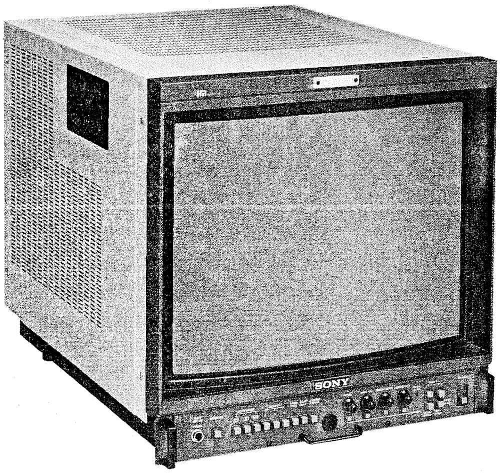
SONY®

TRINITRON® COLOR VIDEO MONITOR

BVM-1915
BVM-2015P
BVM-2015PM



HR TRINITRON

OPERATION AND MAINTENANCE MANUAL

2nd Edition

Serial No. 2000071 and Higher (BVM-1915)
Serial No. 2000001 and Higher (BVM-2015P)
(EBU N-10 LEVEL)
Serial No. 2000001 and Higher (BVM-2015PM)

Warning—This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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"This equipment has been tested with a Class A Computing Device and has been found to comply with Part 15 of FCC rules."
—or—
"This equipment complies with the requirements in Part 15 of FCC rules for a Class A Computing Device."
—or equivalent.

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Pour les utilisateurs au Canada

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VORSICHT!!

Hinweis für den Benutzer
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ATTENTION!!

NE PAS UTILISER DE DÉMAGNÉTISEUR EXTÉRITUR POUR DÉMAGNÉTISER L'ÉCRAN.
UTILISER LA TOUCH DE DÉMAGNÉTISATION (DEGAUSS) SUR LE PANNEAU FRONTAL.

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SECTION 1 OPERATION

1-1. Outline

1-1-1. Features

The BVM-1915/2015P/2015PM is a color video monitor designed for critical evaluation of video signals in broadcasting stations and production houses.

High resolution picture

The Fine Pitch Trinitron picture tube (0.4 mm aperture grille) gives a high resolution, high contrast picture. Horizontal resolution is more than 600 TV lines at the center of the picture.

Stabilized color temperature

The newly-developed beam control circuit maintains the color temperature constant for a long period of time.

Split screen for precise picture confirmation

The lower half of the picture can be displayed in monochrome mode while the upper half is displayed in color mode. This facilitates confirmation of the luminance and chrominance channels, evaluation of the noise in chrominance or luminance channel, etc.

Blue only mode for precise evaluation of noise component

In blue only mode, an apparent monochrome display is obtained with all three control grids driven with a blue signal. This facilitates color saturation and phase adjustments and observation of VTR noise.

Other features

- Three color standards selectable using the optional plug-in type decoder boards
- Picture set-up function facilitating adjustment of the monitor reference black for the black level of an incoming video signal
- Pulse cross function for simultaneous checking of the horizontal and vertical sync signals or VITS (Vertical Interval Test Signal)
- Built-in crosshatch and 100 % white signal generators facilitating monitor set-up
- VITC (Vertical Interval Time Code) display possible using the optional VITC reader board
- Auto chroma/phase adjustment, auto white balance adjustment etc. are possible using the optional auto set-up adaptor.
- Precise setting of black level of the monitor is possible using the optional black level signal generator.
- A drawer containing convergence, white balance and preset controls, and other function selectors
- Auto and manual degaussing
- Three-position AFC switch
- Overdrive protection circuit to protect against picture tube damage
- EIA standard 19-inch rack mounting possible using the optional rack mount kit

1-1-2. Options

Model No.	Product name	Board name	Use
BKM-1410	NTSC ADAPTOR	BC	Decoder board for NTSC color system
BKM-1411	NTSC COMB ADAPTOR	BB	Comb filter board for NTSC color system
BKM-1412	NTSC COMB ADAPTOR	BT	Dynamic Comb filter board for NTSC color system
BKM-1420	PAL ADAPTOR	BD	Decoder board for PAL color system
BKM-1421	PAL-M ADAPTOR	BM	Decoder board for PAL-M color system
BKM-1422	PAL COMB ADAPTOR	BT	Comb filter board for PAL color system
BKM-1430	SECAM ADAPTOR	BE	Decoder board for SECAM color system
BKM-1440	RGB/COMPONENT ADAPTOR	BF	Decoder outputs of RGB or component signals
BKM-1460	VITC ADAPTOR	BL	Reader of Vertical Interval Time Code
BKM-1470	SAFE AREA DISPLAY	BQ	For displaying the safe area
BKM-1480	BLACK LEVEL SIGNAL GENERATOR	BS	For generating black level singnals
BKM-2056	AUTO SET-UP ADAPTOR	BN BO	Auto chroma/phase adjustment, auto white balance adjustment, selection of color temperature
BKM-2085 -20	DIGITAL 4:2:2 SERIAL INPUT KIT	BA3 BV	For input of the component digital video signal
BKM-2090 -20	D-2 SERIAL INPUT KIT	BA3 BU	For input of the composite digital video signal
BKM-2000	RACK MOUNT KIT	—	For EIA standard 19 inch rack mounting

Combinations of the optional boards

The BVM-1915 is supplied with the BT circuit board (NTSC comb adaptor) and BC circuit board (NTSC adaptor).
The BVM-2015P is supplied with the BD circuit board (PAL color system decoder), while the BVM-2015PM is supplied with the BM circuit board (PAL-M color system decoder).
You can choose up to five optional B boards below including BT, BC, BD or BM. The combinations of the B boards are limited depending on which boards can be accepted for each board compartment.

B1 through B5 compartments accept the boards as follows:

Board name (Function)	**Compartment name**				
	B5	**B4**	**B3**	**B2**	**B1**
BB (NTSC COMB FILTER)	X	O	O	O	O
BT (NTSC COMB FILTER)	O	O	O	O	O
BT (PAL COMB FILTER)	O	O	O	O	O
BC (NTSC DECODER)	O	O	O	O	O
BD (PAL DECODER)	O	O	O	O	O
BE (SECAM DECODER)	O	O	O	O	O
BM (PAL-M DECODER)	O	O	O	O	O
BF (RGB/COMPONENT)	X	X	O	X	X
BL (VITC)	X	X	X	O	X
BQ (SAFE AREA DISPLAY)	X	△	X	O	X
BS (BLACK LEVEL SIGNAL GENERATOR)	O	O	O	O	O
BN BO (AUTO SET-UP ADAPTOR)	O	O	X	X	X
BV (Digital 4:2:2 serial interface)	X	X	X	X	O
BU (D-2 serial interface)	X	X	X	X	O

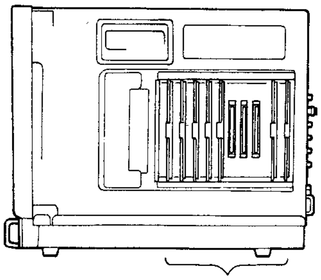
O: acceptable
X: not acceptable
△: acceptable but the switch or control settings on the sub control panels cannot control the display.

Notes

- Insert BA, BG, BH, BI and BJ boards into their respective compartments of the same name.
- Do not leave B5 compartment blank. Insert one of the boards specified in the above table. If no board is inserted, the luminance/chrominance or luminance channel will not be activated in composite signal mode.
- Do not insert BD (PAL DECODER) and BM (PAL-M DECODER) boards simultaneously. This causes malfunction of the monitor.
- Do not insert BB (NTSC COMB FILTER) and BT (NTSC COMB FILTER) boards simultaneously. This causes malfunction of the monitor.

For details on installation, refer to the operation and maintenance manual of the optional board.

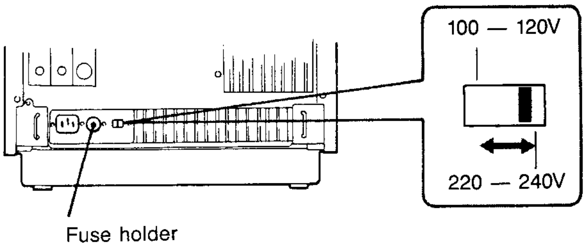
Right view (with the cabinet removed)



1-2. Voltage Selection

The monitor operates on either 220 - 240 or 100 - 120 V AC. Before connecting the unit to an AC outlet, make sure the voltage selector at the rear of the unit is set to the local power line voltage. Change the position of the selector if necessary.
The factory preset operating voltage of each model is as follows.

BVM-1915/2015PM	100 - 120 V
BVM-2015P	220 - 240 V



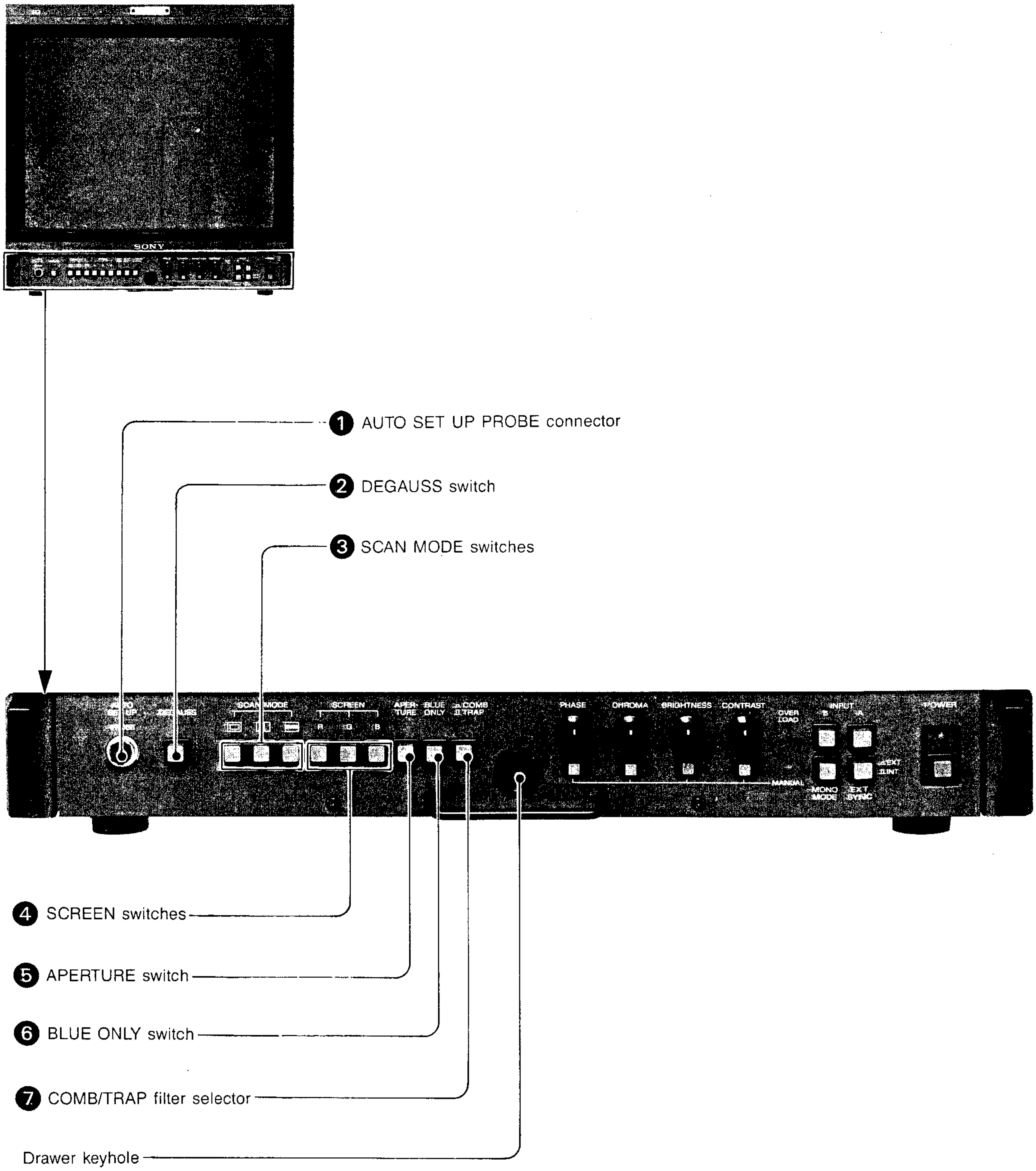
Note

Use a T2A/250V fuse for 220 - 240 V AC operation, and a 4A/125V fuse for 100 - 120 V AC operation. The appropriate fuse is installed at the factory in accordance with the voltage presetting. If you change the voltage selector setting, replace the fuse with an appropriate one.

1-3. Location and Function of Controls

1-3-1. Front Panel

Common to the BVM-1915/2015P/2015PM


SONY
❶ AUTO SET UP PROBE connector
❷ DEGAUSS switch
❸ SCAN MODE switches
AUTO SET UP PROBE
DEGAUSS
SCAN MODE
SCREEN
R
G
B
APER-TURE
BLUE ONLY
COMB
TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
INPUT
B
A
EXT
INT
MANUAL
MONO MODE
EXT SYNC
POWER
❹ SCREEN switches
❺ APERTURE switch
❻ BLUE ONLY switch
❼ COMB/TRAP filter selector
Drawer keyhole

❶ **AUTO SET UP PROBE connector**
Connect the optional BKM-2053 or BKM-2052 auto set-up probe.

❷ **DEGAUSS switch**
When the power is turned on, automatic degaussing is activated.
To demagnetize the screen manually, press this switch momentarily with the power turned on.
Wait for 5 minutes or more before activating degaussing again.

❸ **SCAN MODE switches**
□ **(underscan):** Depress this switch for underscanning. The display size is reduced by approximately 3 % so that four corners of the raster are visible.
▯ **(horizontal delay):** Depress this switch to observe the horizontal sync signal. The picture is shifted horizontally and the horizontal sync signal is displayed in the left quarter of the screen. Picture brightness is automatically increased for easy observation.
⊟ **(vertical delay):** Depress this switch to observe the vertical sync signal. The picture is shifted vertically and the vertical sync signal is displayed near the center of the screen. Picture brightness is automatically increased for easy observation.

- A pulse cross is displayed by depressing both the ▯ and ⊟ switches.
- To resume normal scanning, press to release the depressed switches.

❹ **SCREEN switches**
The R, G and B switches turn the red, green and blue beams respectively on and off. To turn off the beam, depress the switch. To turn it on again, press to release it.

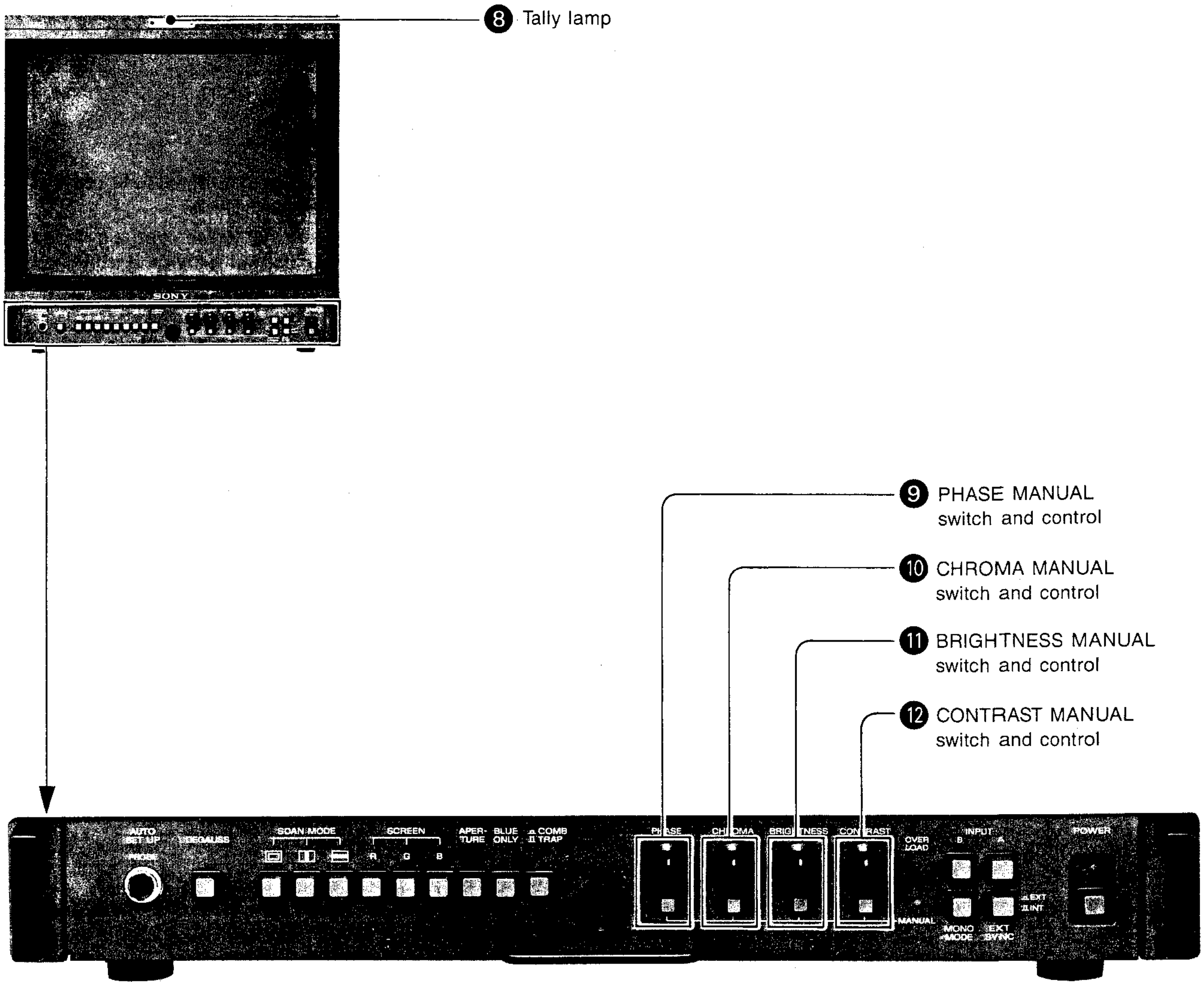
❺ **APERTURE switch**
Normally keep this switch released. A flat frequency response is obtained.
For aperture correction, depress this switch and adjust the APERTURE control inside the drawer. The boost frequency, 4.5 MHz or 6.5 MHz, can be selected with the S1 switch on the BG board.
At the 4.5 MHz position, the frequency response can be adjusted continuously with up to 6 dB boost at 4.5 MHz for subjective enhancement of the displayed picture.
At the 6.5 MHz position, the frequency response can be adjusted continuously with up to 6 dB boost at 6.5 MHz for compensation of the aperture loss of the CRT.

❻ **BLUE ONLY switch**
Normally keep this switch released. Depress this switch to turn off the red and green signals. A blue signal is displayed as an apparent monochrome picture on the screen. This facilitates CHROMA and PHASE control adjustments and observation of VTR noise.

❼ **COMB/TRAP filter selector**
This selector is effective for monitors having the NTSC decoder in which a BKM-1411 (or BKM-1412) NTSC comb adaptor is installed or having the PAL decoder in which BKM-1422 PAL comb adaptor is installed.

	NTSC decoder	PAL decoder
BVM-1915	Supplied	Optional BKM-1420
BVM-2015P	Optional BKM-1410	Supplied
BVM-2015PM	Optional BKM-1410	Supplied (PAL-M)

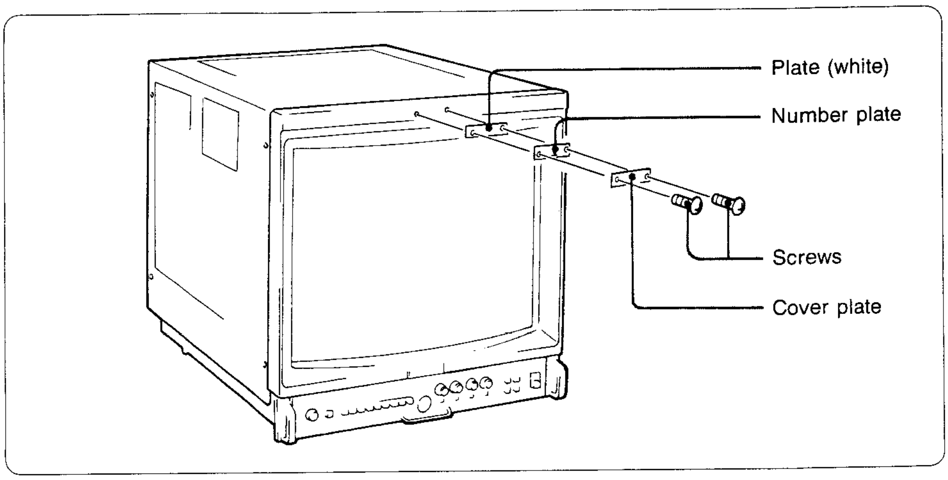
Depress the selector to active the comb filter (⎍ COMB). Press to release it for the trap filter (⊓ TRAP).


⑧ Tally lamp
⑨ PHASE MANUAL switch and control
⑩ CHROMA MANUAL switch and control
⑪ BRIGHTNESS MANUAL switch and control
⑫ CONTRAST MANUAL switch and control
SONY
AUTO SET UP
PROBE
SCAN MODE
SCREEN
R
G
B
APER-TURE
BLUE ONLY
COMB
TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
INPUT
B
A
MANUAL
EXT
INT
MONO MODE
EXT SYNC
POWER

⑧ **Tally lamp**

the lamp lights when No.3 and No.8 pins of the REMOTE connector on the rear panel are shortcircuited.

Attach one of the supplied tally number plates instead of the model number plate, as illustrated below.



⑨ **PHASE MANUAL switch and control**

When this switch is in the released position, the subcarrier phase preset with the PRESET PHASE control inside the drawer is obtained. To adjust the subcarrier phase manually, depress this switch and turn this control.

(This control is not effective when the COLOR STANDARD PAL button is depressed and the PAL D/S selector is set to D, or when the COLOR STANDARD SECAM button is pressed.)

⑩ **CHROMA MANUAL switch and control**

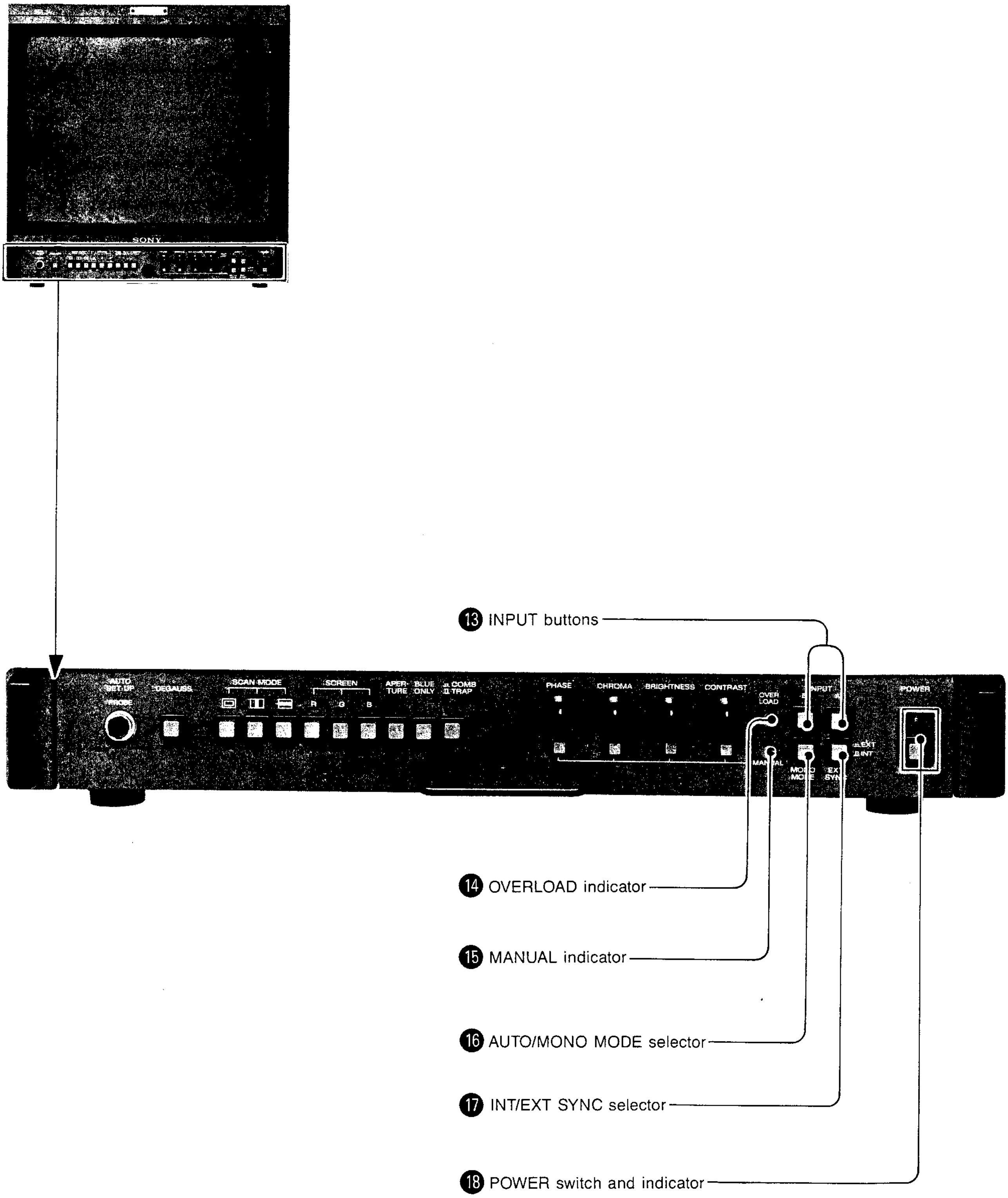
When this switch is in the released position, the color saturation preset with the PRESET CHROMA control inside the drawer is obtained. To adjust the color saturation manually, depress this switch and turn this control.

⑪ **BRIGHTNESS MANUAL switch and control**

When this switch is in the released position, the brightness preset with the PRESET BRIGHTNESS control inside the drawer is obtained. To adjust the brightness manually, depress this switch and turn this control.

⑫ **CONTRAST MANUAL switch and control**

When this switch is in the released position, the contrast preset with the PRESET CONTRAST control inside the drawer is obtained. To adjust the contrast manually, depress this switch and turn this control.


SONY
AUTO SET UP
MODE
DEGAUSS
SCAN MODE
SCREEN
R
G
B
APER-TURE
BLUE ONLY
COMB TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
INPUT
EXT
INT
MANUAL
MONO MODE
EXT SYNC
POWER
⑬ INPUT buttons
⑭ OVERLOAD indicator
⑮ MANUAL indicator
⑯ AUTO/MONO MODE selector
⑰ INT/EXT SYNC selector
⑱ POWER switch and indicator

⑬ **INPUT buttons**
Select the input signal.
A: To monitor the signals connected to the VIDEO A INPUT connector, depress this button.
B: To monitor the signals connected to the VIDEO B INPUT connector, depress this button and press the INPUT SELECT "B" button inside the drawer.

For details on input selection, refer to "INPUT SELECT buttons" on page 1-21.

⑭ **OVERLOAD indicator**
This indicator lights to warn of overdrive of the CRT.

⑮ **MANUAL indicator**
This indicator lights when any of the MANUAL switches ⑨ through ⑫ is depressed.

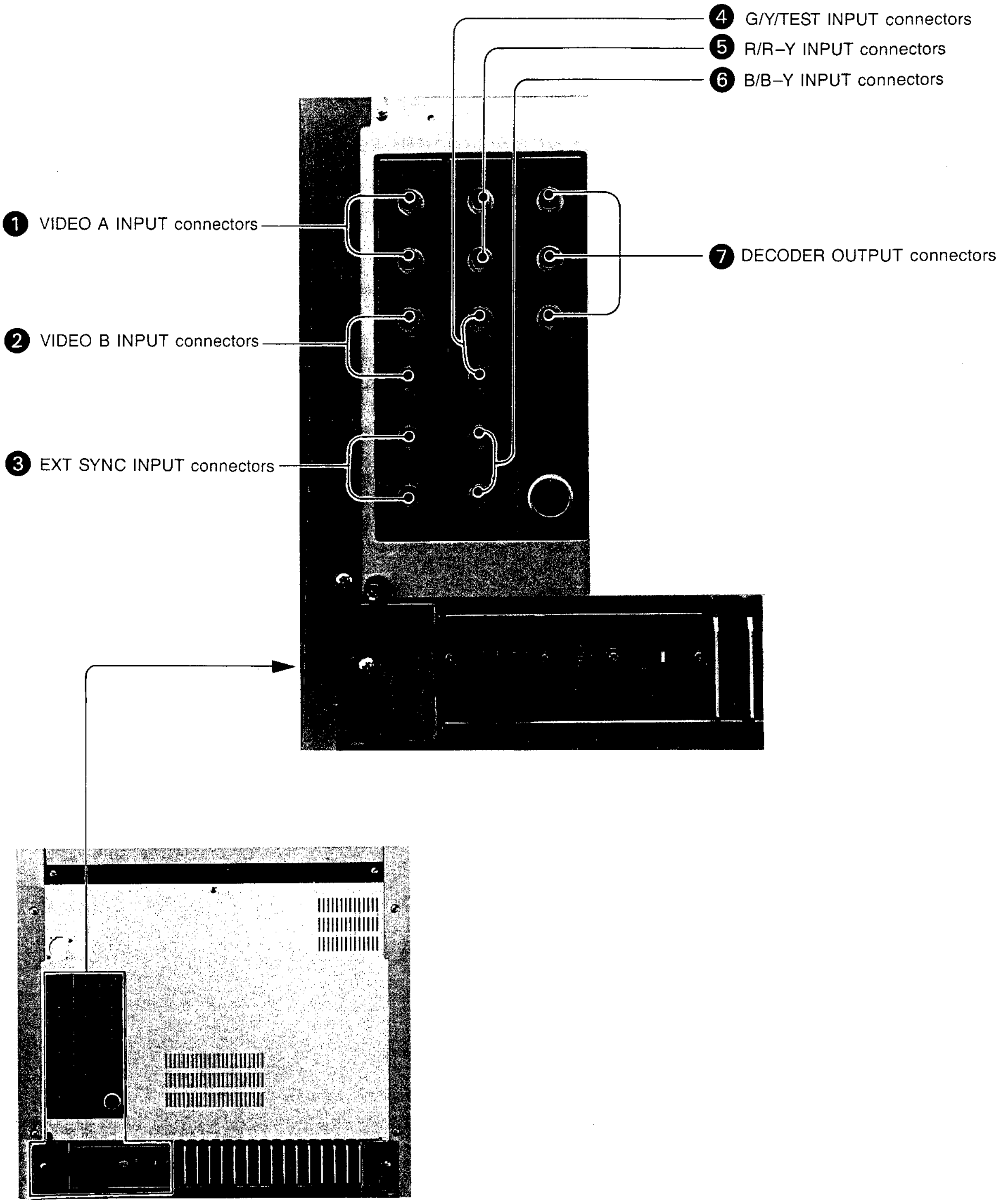
⑯ **AUTO/MONO MODE selector**
Normally keep this selector released (AUTO). Color or monochrome mode is automatically selected according to the presence or absence of color burst. Depress the selector (MONO) to display the monochrome picture.

⑰ **INT/EXT SYNC selector**
Normally keep this selector released (INT). The monitor operates on the sync signal from the displayed composite video signal. To operate the monitor on an external sync signal supplied from the EXT SYNC connector on the rear panel, depress the selector (EXT).

⑱ **POWER switch and indicator**
Depress this switch to turn on the power. The POWER indicator will light. To turn the power off, press the switch again.

1-3-2. Rear Panel

Common to the BVM-1915/2015P/2015PM


④ G/Y/TEST INPUT connectors
⑤ R/R−Y INPUT connectors
⑥ B/B−Y INPUT connectors
① VIDEO A INPUT connectors
⑦ DECODER OUTPUT connectors
② VIDEO B INPUT connectors
③ EXT SYNC INPUT connectors

① **VIDEO A INPUT connectors** (BNC)
② **VIDEO B INPUT connectors** (BNC)

Accept video signals. Use one connector for input and the other for loop-through output.
When the loop-through output is not used, attach a 75-ohm terminator.

③ **EXT SYNC INPUT (external sync input) connectors** (BNC)
Accept sync signals.
Use one connector for input and the other for loop-through output.
When the loop-through output is not used, attach a 75-ohm terminator.

④ **G/Y/TEST INPUT connectors** (BNC)
⑤ **R/R−Y INPUT connectors** (BNC)
⑥ **B/B−Y INPUT connectors** (BNC)
Input an RGB, component (Y, R−Y, B−Y) or test signal. The input signal can be selected with the INPUT SELECT buttons on the sub control panel. Use one connector for input and the other for loop-through output. When the loop-through output is not used, attach a 75-ohm terminator.

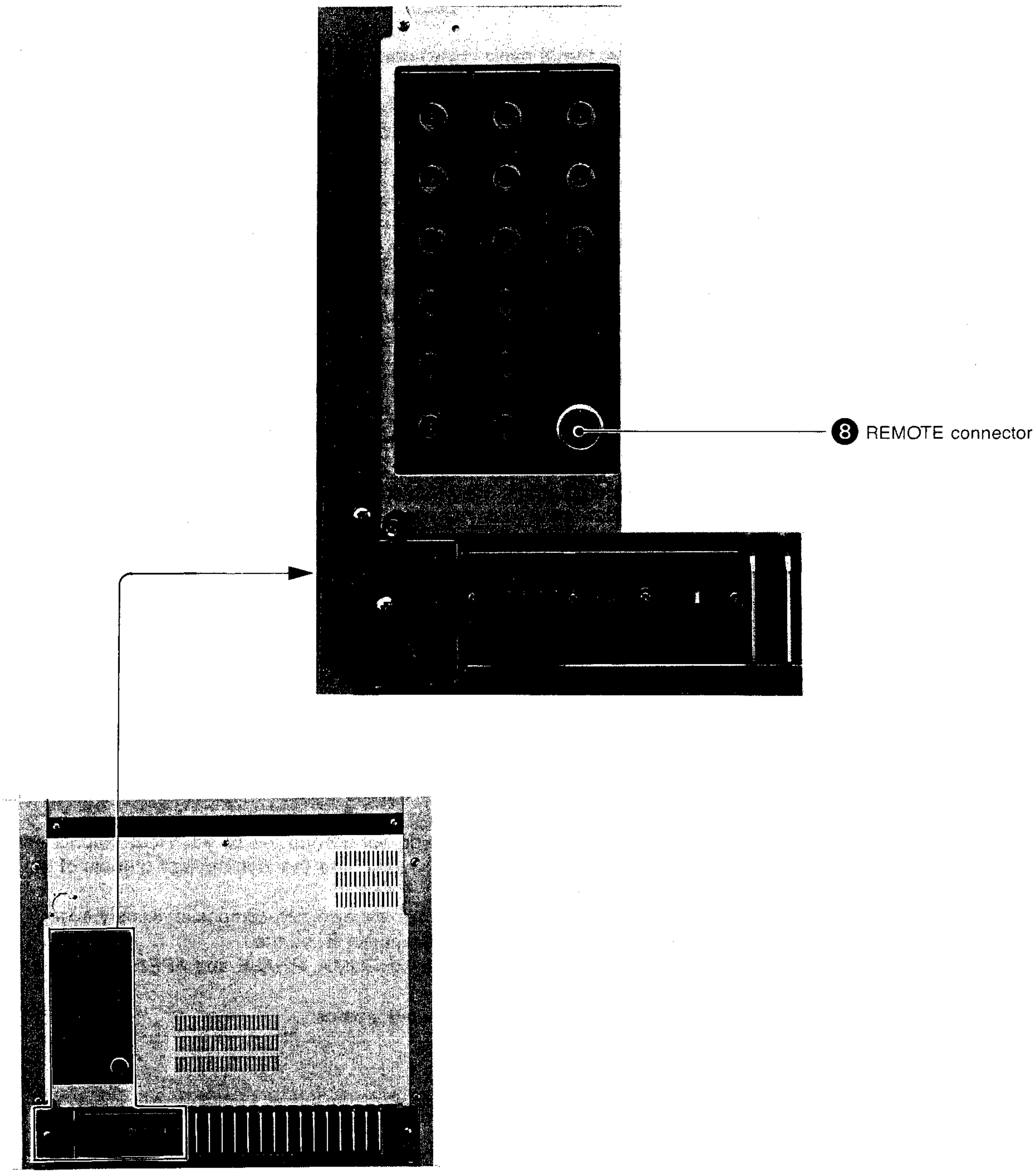
⑦ **DECODER OUTPUT connectors** (BNC)
These connectors provide RGB or component (Y, R−Y, B−Y) outputs decoded from the signals displayed on the screen, only when the BKM-1440 RGB/component adaptor is installed.
The RGB or component outputs are selected with the S1 selector on the BF board of the BKM-1440 kit.

Quick reference for output selection

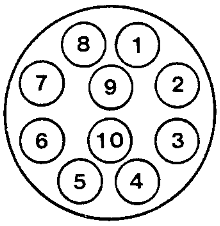
Output signal / Operation	Component	RGB
S1 selector on BF board	Lower position	Upper position
Input signal	Encoded VIDEO A, VIDEO B, TEST or component	
Output connectors	DECODER OUTPUT (R/R−Y, G/Y, B/B−Y)	

Notes

- The DECODER OUTPUT connectors do not provide the correct RGB outputs from the displayed RGB signals. For RGB output, use the loop-through outputs of the R/G/B input connectors
- The outputs from non-composite signals are also non-composite. Supply sync signals from the EXT SYNC INPUT connector if required.
- The output signals are affected by the CHROMA, PHASE and APERTURE controls and MATRIX switch.
- The color killer is not activated for output signals.


8 REMOTE connector

❽ **REMOTE connector** (10-pin)
Use the supplied 10-pin connector.



To enter remote control mode, short-circuit pin No.5 with pin No.8.
The relationship between the function and pin connections in remote control mode are shown below.

Function			**Pin No.**						
INPUT*	**SYNC***	**MODE***	**1**	**2**	**3**	**4**	**5**	**6**	**7**
VIDEO A	INT	AUTO	O	O	—	O	S	—	—
		MONO	S	O	—	O	S	—	—
	EXT	AUTO	O	O	—	S	S	—	—
		MONO	S	O	—	S	S	—	—
VIDEO B	INT	AUTO	O	S	—	O	S	—	—
		MONO	S	S	—	O	S	—	—
	EXT	AUTO	O	S	—	S	S	—	—
		MONO	S	S	—	S	S	—	—
VITC OFF**			—	—	—	—	—	S	—
VITC HOLD**			—	—	—	—	—	O	S
TALLY ON			—	—	S	—	—	—	—

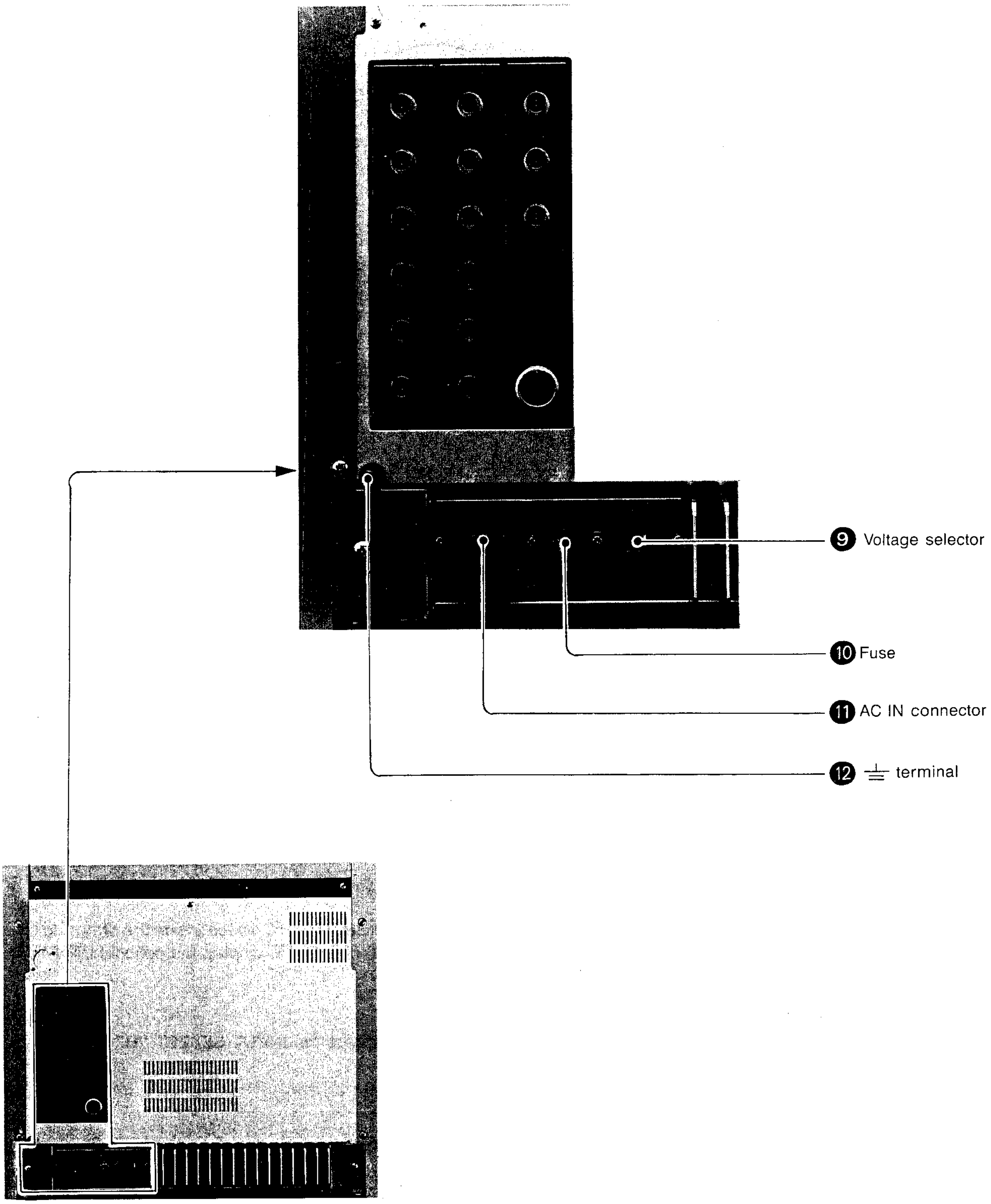
S: Short-circuit with pin No.8
O: Open
—: Either S or O.

* Remote control operations have priority over the MODE, INPUT and SYNC selectors on the front panel.

** To remotely control the VITC display, first set the VITC switch inside the drawer to ON and then short-circuit pin 6 or 7 with pin 8. (For VITC display, the optional BKM-1460 is required.)

Note

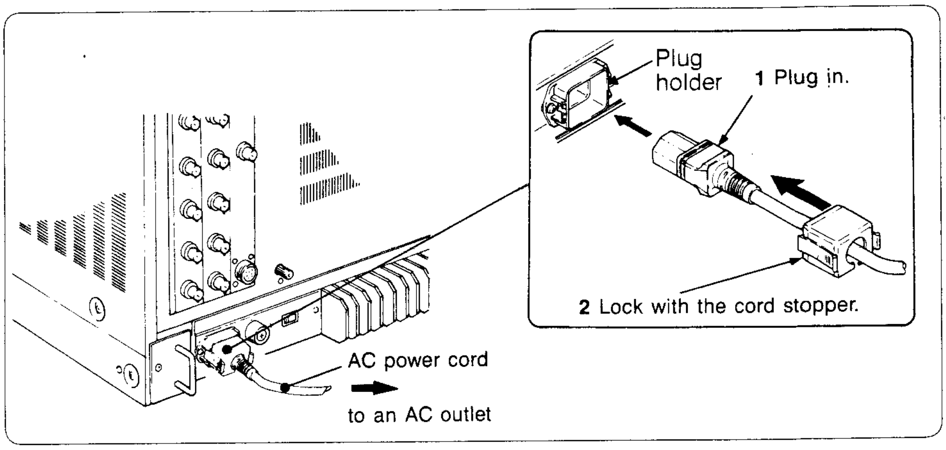
For remote control operations, be sure to depress the INPUT SELECT "B" button inside the drawer.


⑨ Voltage selector
⑩ Fuse
⑪ AC IN connector
⑫ ⏚ terminal

⑨ **Voltage selector**
Set to the local power line voltage, 220 - 240 V AC or 100 - 120 V AC.

⑩ **Fuse**
Use a T2A fuse for operation on 220 - 240 V AC, or a 4A fuse for operation on 100 - 120 V AC.

⑪ **AC IN connector**
Connect the supplied AC power cord here and secure it with the supplied cord stopper, if required.


Plug holder
1 Plug in.
2 Lock with the cord stopper.
AC power cord
to an AC outlet

NOTICE

THIS NOTICE IS APPLICABLE FOR THE USA ONLY.

If shipped to the USA, use the UL LISTED power cord specified below for 220 - 240 V operation.

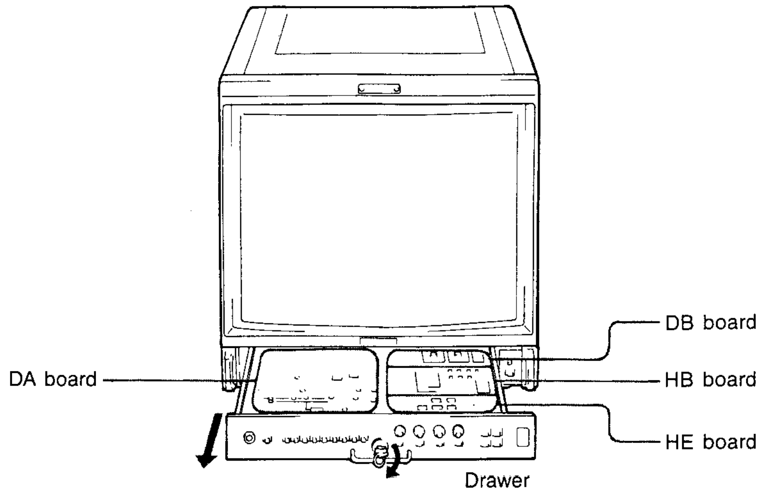
DO NOT USE ANY OTHER POWER CORD.

Plug cap	Tandem blade with ground pin.
Cord	Type SJT, three 16 or 18 AWG Wires.
Length	Maximum 15 feet
Rating	Minimum 10 A, 250 V

⑫ **Ground (⏚) terminal**
Connect to the system ground, if necessary.

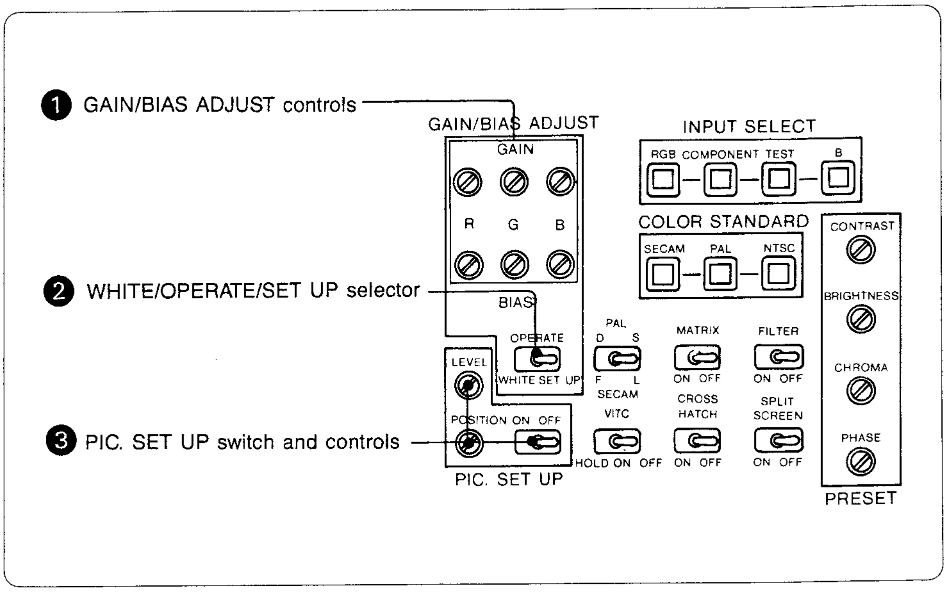
1-3-3. Sub Control Panels inside the Drawer

Insert the supplied key into the keyhole of the drawer lock, turn it 90° clockwise and pull the drawer out.


DB board
DA board
HB board
HE board
Drawer

- Adjust the controls on the sub control panels when the monitor is fully warmed up. Warm-up time will be at least 30 minutes after the power has been turned on.
- Adjust the control using the supplied screwdriver.

HB board (Function selection and white balance adjustment section)


① GAIN/BIAS ADJUST controls
② WHITE/OPERATE/SET UP selector
③ PIC. SET UP switch and controls
GAIN/BIAS ADJUST
GAIN
R G B
BIAS
OPERATE
WHITE SET UP
LEVEL
POSITION ON OFF
PIC. SET UP
INPUT SELECT
RGB COMPONENT TEST B
COLOR STANDARD
SECAM PAL NTSC
PAL D S
F L
SECAM
VITC
HOLD ON OFF
MATRIX
ON OFF
CROSS HATCH
ON OFF
FILTER
ON OFF
SPLIT SCREEN
ON OFF
CONTRAST
BRIGHTNESS
CHROMA
PHASE
PRESET

① GAIN/BIAS ADJUST controls

Used for white balance adjustment.

GAIN and BIAS controls are provided for the R (red), G (green) and B (blue) screens.

BIAS: Set the WHITE/OPERATE/SET UP selector ② to SET UP and adjust the white balance and brightness of the screen at the lowlight with these controls.

GAIN: Set the WHITE/OPERATE/SET UP selector ② to WHITE and adjust the white balance and contrast of the screen at the highlight with these controls. For details on the white balance adjustment, refer to "1-4. WHITE BALANCE ADJUSTMENT" on page 1-30.

② WHITE/OPERATE/SET UP selector

OPERATE: Normally set to this position for normal monitoring.

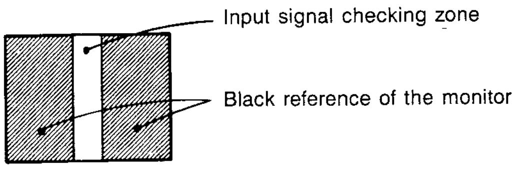
WHITE: When adjusting the white balance at the highlight, set to this position. Internal 100 % white signal is displayed on the screen.

SET UP: When adjusting the white balance at the lowlight, set to this position. A horizontal white bar of approximately 1/3 the screen height is displayed.

③ PIC. SET UP (picture set up) switch and controls

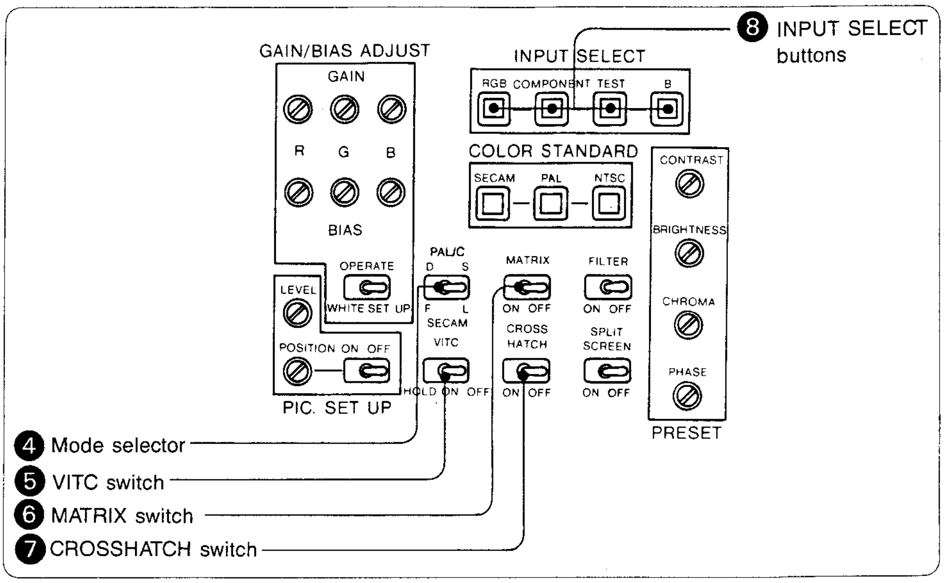
Used to match the black reference of the monitor with the black level of the input signal.

ON/OFF switch: When this switch is set to ON, a vertical picture band and the black reference of the monitor are displayed on the screen for easy level comparison.


Input signal checking zone
Black reference of the monitor

POSITION control: Move the position of the picture band horizontally so that the black signal of the picture is located next to the black reference area.

LEVEL control: Adjust this control to match the brightness of the black reference area with that of the input black signal.


⑧ INPUT SELECT buttons
GAIN/BIAS ADJUST
GAIN
R G B
BIAS
INPUT SELECT
RGB COMPONENT TEST B
COLOR STANDARD
SECAM PAL NTSC
CONTRAST
BRIGHTNESS
CHROMA
PHASE
PRESET
OPERATE
WHITE SET UP
LEVEL
POSITION ON OFF
PIC. SET UP
PAL/C
D S
F L
SECAM
VITC
HOLD ON OFF
MATRIX
ON OFF
CROSS HATCH
ON OFF
FILTER
ON OFF
SPLIT SCREEN
ON OFF
④ Mode selector
⑤ VITC switch
⑥ MATRIX switch
⑦ CROSSHATCH switch

④ Mode selector

This selector functions as the C (comb) D/S selector for NTSC color system, as the PAL D/S selector for PAL color system, and as the SECAM F/L selector for SECAM color system.

C (comb) D/S selector: Selects the comb filter mode of the NTSC system, D (dynamic comb) or S (Simple comb). Normally set to D.

Dynamic comb: The correlative comb filter which minimizes dot interference in the area with less line correlation is activated.

Simple comb: The simple comb filter without line correlation is activated.

PAL D/S selector: Selects the demodulation mode of the PAL system, D (deluxe) or S (simple). Normally set to D.

SECAM F/L selector: Selects the ID signal of the SECAM system, L (line) or F (field). Normally set to L.

⑤ VITC (Vertical Interval Time Code) switch

This switch functions only when the optional BKM-1460 VITC adaptor is installed.

ON: Set to this position to display the VITC.

OFF: To turn off the VITC display.

HOLD: To hold the VITC figure, press the switch momentarily to this position. To run the VITC again, press the switch to this position again.

⑥ MATRIX switch

Normally set this switch to OFF. Set to ON to activate the matrix circuit so that the chromaticity of the displayed picture more closely approximates to that of "true" NTSC phosphors.

⑦ CROSSHATCH switch

Set to ON to display the internal crosshatch pattern for adjusting convergence, etc. The crosshatch pattern is synchronized to the selected composite sync signal.

⑧ INPUT SELECT buttons

To monitor one of the following four input signals, depress the INPUT B selector on the front panel and press the appropriate button.

RGB: To monitor the R/G/B signals connected to the R/R–Y, G/Y/TEST and B/B–Y connectors

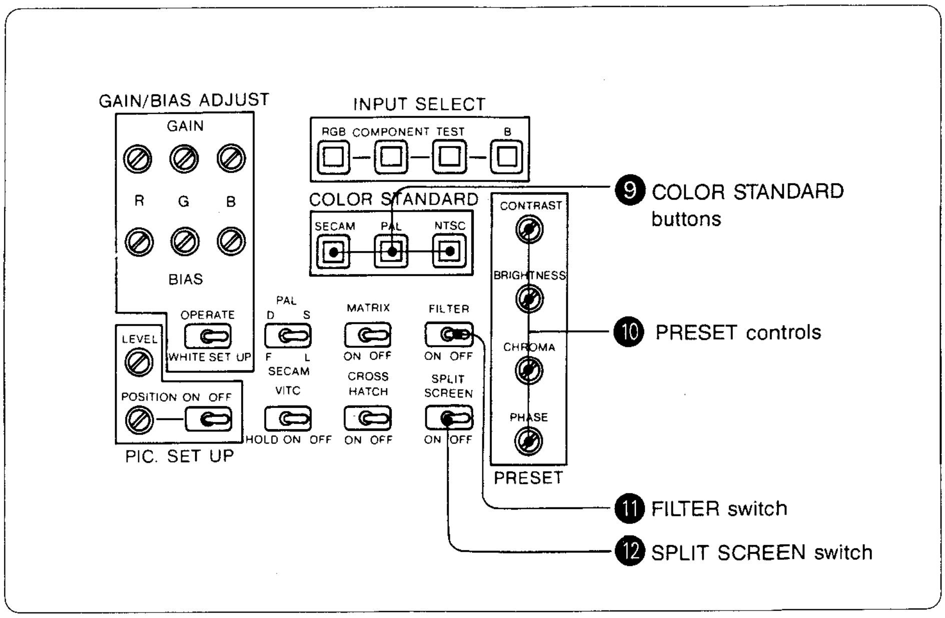
COMPONENT: To monitor the component (R–Y, Y and B–Y) signals connected to the R/R–Y, G/Y/TEST and B/B–Y connectors

TEST: To monitor the composite video signals connected to the G/Y/TEST connectors

B: To monitor the composite video signals connected to the VIDEO B INPUT connector

Quick reference for input selection

Input signal / Operation	Encoded video			Component	RGB
	VIDEO A	VIDEO B	TEST		
INPUT selectors (front panel)	A	B	B	B	B
INPUT SELECT buttons (Inside the drawer)		B	TEST	COMPONENT	RGB
INPUT connectors	VIDEO A	VIDEO B	G/Y/TEST	R/R–Y G/Y/TEST, B/B–Y	R/R–Y, G/Y/TEST, B/B–Y


GAIN/BIAS ADJUST
GAIN
R G B
BIAS
OPERATE
LEVEL
WHITE SET UP
POSITION ON OFF
PIC. SET UP
INPUT SELECT
RGB COMPONENT TEST B
COLOR STANDARD
SECAM PAL NTSC
PAL D S
F L
SECAM VITC
HOLD ON OFF
MATRIX
ON OFF
CROSS HATCH
ON OFF
FILTER
ON OFF
SPLIT SCREEN
ON OFF
CONTRAST
BRIGHTNESS
CHROMA
PHASE
PRESET
⑨ COLOR STANDARD buttons
⑩ PRESET controls
⑪ FILTER switch
⑫ SPLIT SCREEN switch

⑨ COLOR STANDARD buttons

Select the color standard of the input picture.
For displaying the picture of each color standard, the appropriate decoder board (optional) should be installed. See page 1-2.

SECAM: For SECAM standard
PAL: For PAL or PAL-M standard
NTSC: For NTSC standard

Note

If the decoder board for the selected color system is not installed:

- The picture does not appear on the screen when the FILTER switch is set to ON.
- The picture is displayed in monochrome mode when the FILTER switch is set to OFF.

⑩ PRESET controls

Used to adjust the preset levels.
CONTRAST: Preset the picture contrast level.
BRIGHTNESS: Preset the picture brightness level.
CHROMA: Preset the color saturation level.
PHASE: Preset the subcarrier phase.

⑪ FILTER switch

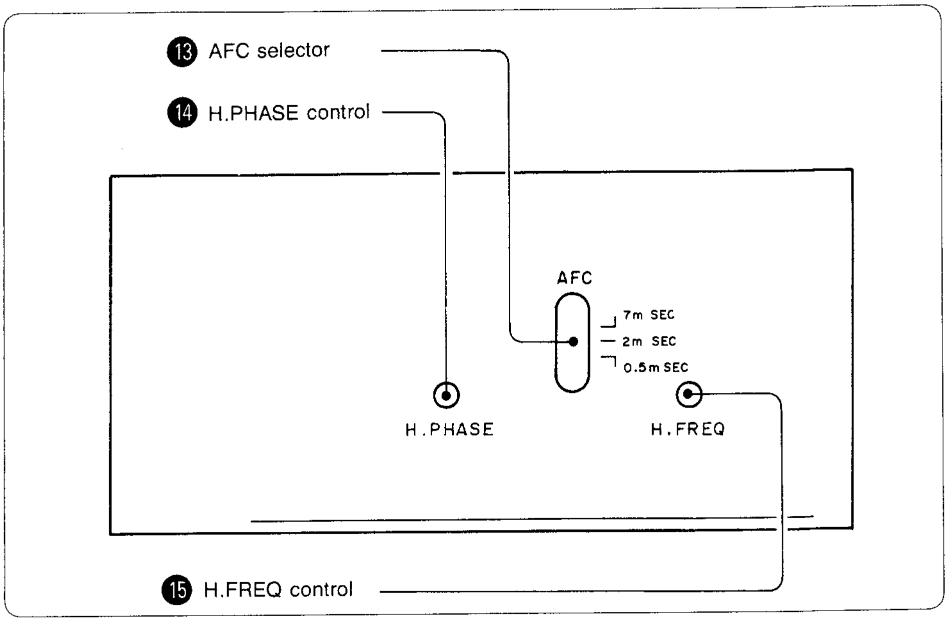
This switch functions only when the AUTO/MONO MODE selector on the front panel is set to MONO.
Normally set to ON to activate the comb or trap filter. Set to OFF to deactivate the filter for a wider frequency range.

- When the MODE selector is set to AUTO, the filter is always activated for color signals regardless of this switch setting.

⑫ SPLIT SCREEN switch

Normally set to OFF. When this switch is set to ON, the lower half of the picture is displayed in monochrome mode.

DB board (H.V. oscillator section)


⑬ AFC selector
⑭ H.PHASE control
AFC
7m SEC
2m SEC
0.5m SEC
H.PHASE
H.FREQ
⑮ H.FREQ control

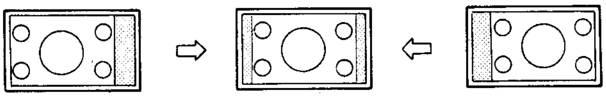
⑬ **AFC (automatic frequency control) selector**
Selects the AFC time constant.

0.5 mSEC (fast): This mode is fast enough to correct for VTR jitter. Set to this position to obtain a stable playback picture from a VTR.

2 mSEC (normal): Normally set to this position.

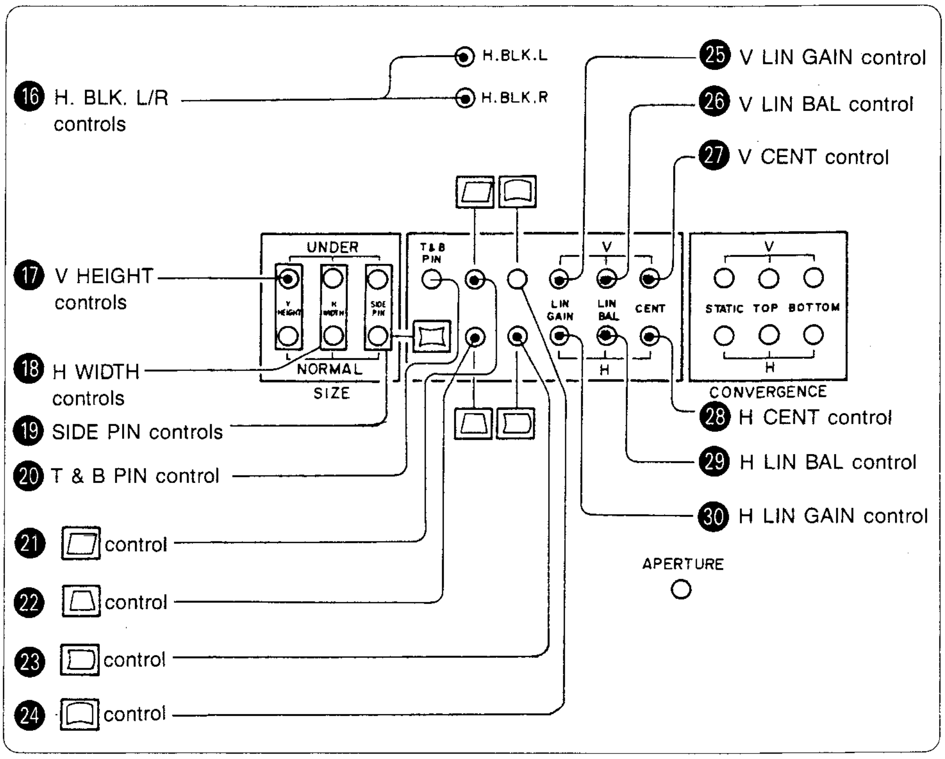
7 mSEC (slow): This mode is slow enough to display the time base instability introduced by mechanical jitter, in the VTR playback signal.

⑭ **H.PHASE (horizontal phase) control**
Used to adjust the horizontal position of the picture.

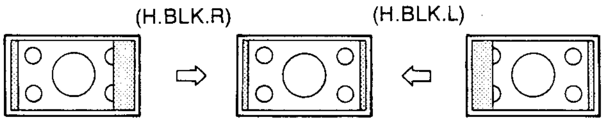


⑮ **H.FREQ (oscillator) control**
Used to adjust the free-run horizontal frequency.

DA board


⑯ H. BLK. L/R controls
H.BLK.L
H.BLK.R
⑰ V HEIGHT controls
⑱ H WIDTH controls
⑲ SIDE PIN controls
⑳ T & B PIN control
㉑ ▱ control
㉒ □ control
㉓ □ control
㉔ □ control
UNDER
V HEIGHT
H WIDTH
SIDE PIN
NORMAL
SIZE
T&B PIN
V
LIN GAIN
LIN BAL
CENT
H
STATIC
TOP
BOTTOM
CONVERGENCE
APERTURE
㉕ V LIN GAIN control
㉖ V LIN BAL control
㉗ V CENT control
㉘ H CENT control
㉙ H LIN BAL control
㉚ H LIN GAIN control

⑯ H BLK. L/R (horizontal blanking left/right) controls
Used to adjust the width of the horizontal blanking at both sides of the screen.


(H.BLK.R)
(H.BLK.L)

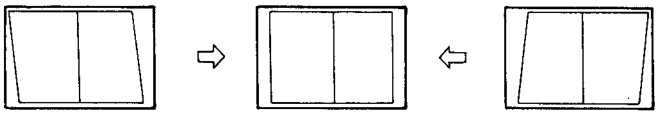
⑰ V HEIGHT (vertical height) controls
Used to adjust the height of the picture. Use the NORMAL control for the normal picture, and the UNDER control for the underscanned picture.

⑱ H WIDTH (horizontal width) controls
Used to adjust the horizontal width of the picture. Use the NORMAL control for the normal picture, and the UNDER control for the underscanned picture.

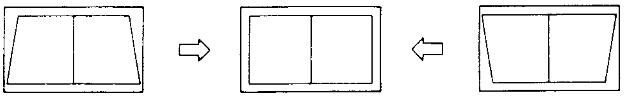
⑲ SIDE PIN (pincushion) controls
Used to correct the side pincushion distortion. Use the NORMAL control for the normal picture, and the UNDER control for the underscanned picture.

⑳ T & B PIN (top and bottom pincushion distortion) controls
Used to correct the top and bottom pincushion distortion. Use the NORMAL control for the normal picture, and the UNDER control for the underscanned picture.

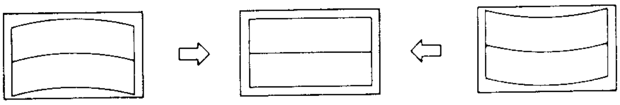
㉑ ▱ (parallelogram distortion) control
Used to correct the right angled distortion of the deflection yoke.



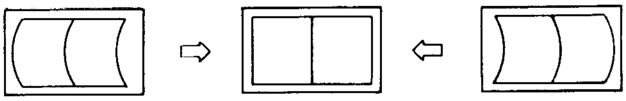
㉒ ▢ (side pincushion tilt) control
Used to adjust the phase of the side pincushion distortion.



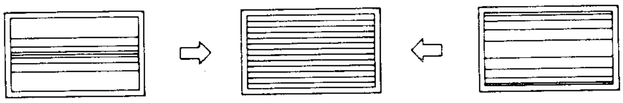
㉓ ▢ (top and bottom pincushion balance) control
Used to adjust the distortion at the center (X axis) of the picture.



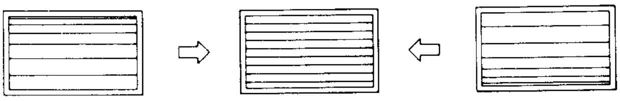
㉔ ▢ (horizontal centering linearity) control
Used to adjust the horizontal linearity at the center of the picture.



㉕ V LIN GAIN (vertical linearity gain) control
Used to adjust the vertical linearity of the picture.



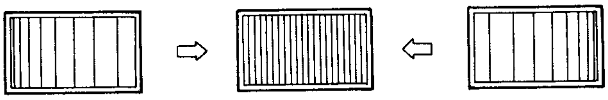
㉖ V LIN BAL (vertical linearity balance) control
Used to adjust the balance of the vertical (Y axis) linearity of the picture.



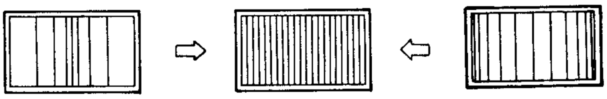
㉗ V CENT (vertical centering) control
Used to adjusts the vertical position of the picture.

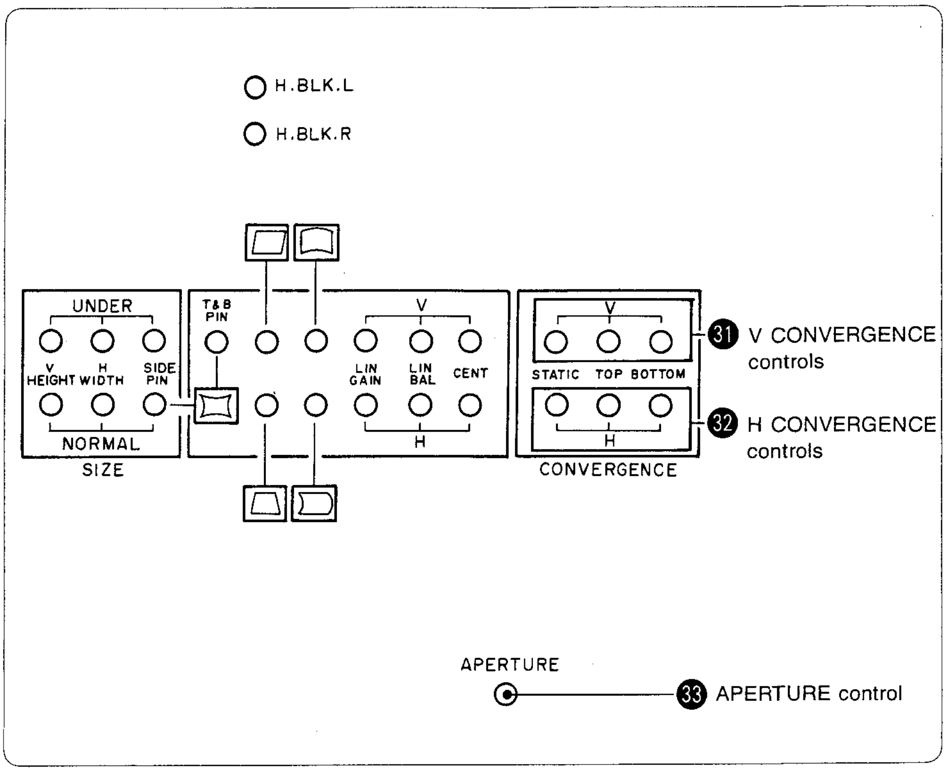
㉘ H CENT (horizontal centering) control
Used to adjusts the horizontal position of the picture.

㉙ H LIN BAL (horizontal linearity balance) control
Used to adjust the balance of the horizontal (X axis) linearity of the picture.



㉚ H LIN GAIN (horizontal linearity gain) control
Used to adjust the horizontal linearity of the picture.

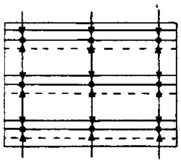
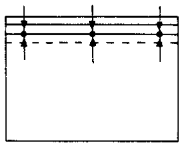
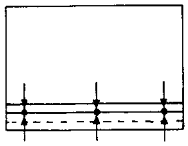
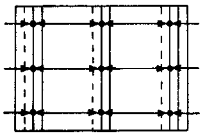
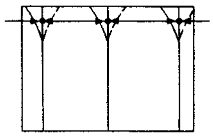
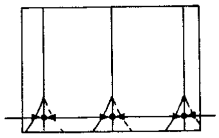



H.BLK.L
H.BLK.R
UNDER
V HEIGHT
H WIDTH
SIDE PIN
NORMAL
SIZE
T&B PIN
V
LIN GAIN
LIN BAL
CENT
H
V
STATIC
TOP
BOTTOM
H
CONVERGENCE
㉛ V CONVERGENCE controls
㉜ H CONVERGENCE controls
APERTURE
㉝ APERTURE control

㉛ V (vertical) CONVERGENCE controls

㉜ H (horizontal) CONVERGENCE controls

Used to adjust the vertical (Y axis) or horizontal (X axis) convergence of corresponding portion of the screen as follows.

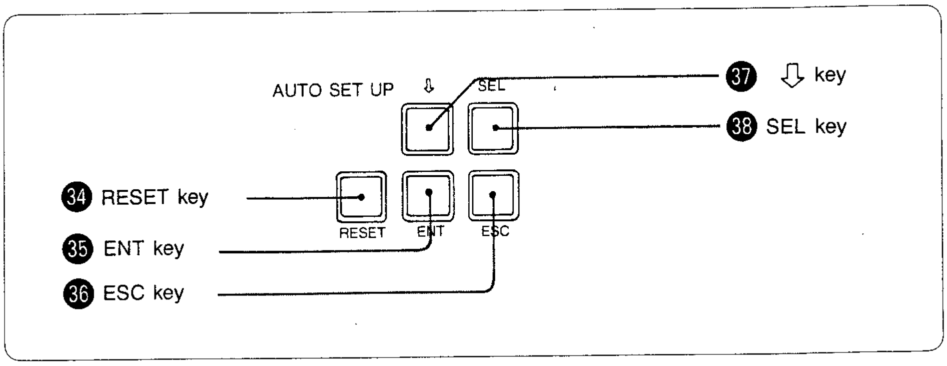
	STATIC	TOP	BOTTOM
V (vertical)			
H (horizontal)			

㉝ APERTURE control

Used to adjusts the frequency response when the APERTURE switch on the front panel is depressed.

HE board (Auto chroma/phase adjustment, Auto white balance adjustment section)

To activate these keys, the optional BKM-2056 auto set-up adaptor must be installed.



㉞ RESET key
Press to reset the auto set-up operation and return to the initial status. This key is operative even when automatic adjustment is in operation.

㉟ ENT (enter) key
Press to advance to the next step during auto set-up operation and to present next menu choice. This key is also used to start the auto set-up operation.

㊱ ESC (escape) key
Press to return to the previous step during auto set-up operation. This key is not operative while automatic adjustment is in operation.

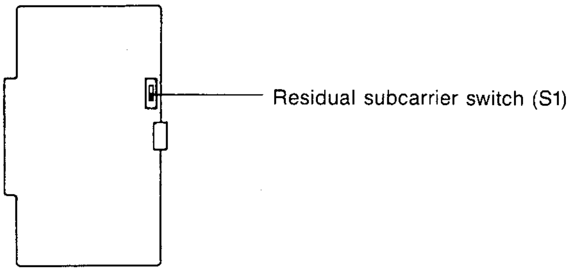
㊲ ⇩ (cursor) key
For selecting options from menus. Each time this key is pressed, the cursor moves downwards, and then to the top.

㊳ SEL (select) key
Press to set the monitor to color temperature selection mode. Also used to select the memory position of the probe in color analyzer mode.

1-3-4. Switches inside the Cabinet

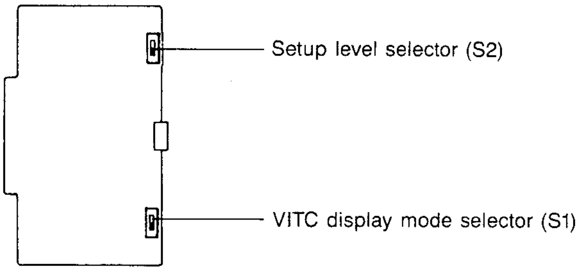
Remove the cabinet, referring to SECTION 2.

BJ board



Residual subcarrier switch (S1)
This switch is factory-preset to the lower position (OFF).
Normally there will be no residual subcarrier in input video signals. However, if a residual subcarrier is present, this may affect the display.
Set this switch to the upper position (ON) to check if a residual subcarrier is present. If it is present in the incoming signal, color shift appears in the picture.

BH board

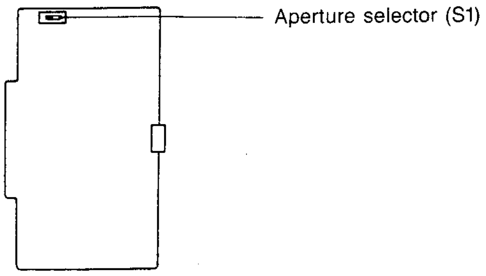


Setup level selector (S2)
Select the setup level.
O IRE: Setup level is 0 %.
AUTO: Factory-preset position. Setup level is 0 % when the field frequency of the input signal is 50 Hz, and 7.5 % when the field frequency is 60 Hz.
7.5 IRE: Setup level is 7.5 %

The setup level can be adjusted with the controls on the BH board: 0 % level with the RV1 control, and 7.5 % level with the RV2 control in the range from −2.5 % through +12.5 %.

VITC display mode selector (S1)
Used to invert the character and background colors.
Upper position: Factory-preset position. The VITC is displayed in white characters with black background.
Lower position: The VITC is displayed in black characters with white background.
For details, refer to the operation and maintenance manual of the BKM-1460 VITC adaptor.

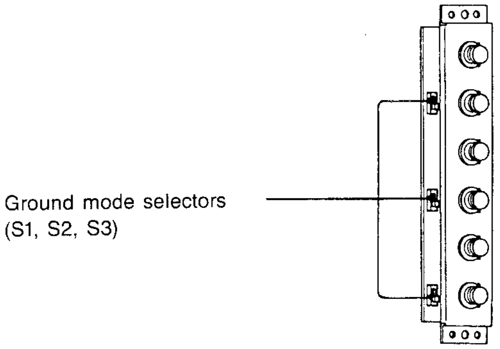
BG board



Aperture selector (S1)
Selects the boost frequency, 4.5 MHz or 6.5 MHz, for aperture correction. This selector is factory-preset to 4.5 MHz.

QA and QB boards

The QA and QB boards are located behind the INPUT connector panels.
Remove the INPUT connector panels, referring to Section 2.



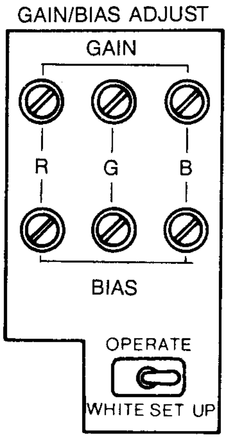
Ground mode selectors (S1, S2, S3)
Three selectors are provided for each VIDEO A, VIDEO B and EXT SYNC connectors (QA board), or for each R/R–Y, G/Y/TEST and B/B–Y connectors (QB board).

S (non-floating): Factory-preset position. Normally keep the selectors at this position.

F (floating): When there is hum in the input signal, set to this position. Common mode noises will be rejected.

1-4. White Balance Adjustment

Use the WHITE/OPERATE/SET UP selector and GAIN/BIAS ADJUST controls inside the drawer.
During adjustment, turn the red, green and blue beams on and off with the SCREEN switches on the front panel, as required.



1 Display a test signal on the screen.

2 Set the WHITE/OPERATE/SET UP selector to SET UP.

3 Adjust the white balance at the lowlight with the BIAS controls.

4 Set the WHITE/OPERATE/SET UP selector to WHITE.

5 Adjust the white balance at the highlight with the GAIN controls.

6 After adjustment, set the WHITE/OPERATE/SET UP selector to OPERATE.

Note
For white balance adjustment using a color analyzer or equivalent, see SECTION 2.

1-5. Specifications

Common to the BVM-1915/2015P/2015PM

System	**BVM-2015P** 625 lines per picture, 50 fields per second interlaced, PAL **BVM-1915/2015PM** 525 lines per picture, 60 fields per second interlaced, NTSC (BVM-1915) / PAL-M (BVM-2015PM)
CRT	Fine Pitch Trinitron 0.4 mm aperture grille, 90-degree deflection, ϕ30.6 mm in-line gun Effective picture size: 291 × 386 mm (h/w) ($11\frac{1}{2} \times 15\frac{1}{4}$ inches) 481 mm (19 inch) picture measured diagonally

Input

Connectors	BNC type (12)
Video	VIDEO A/B, TEST, R/G/B 0.7 Vp-p, non-composite or 1 Vp-p, composite, video signal ±6 dB positive, high impedance, with loop-through output Y/R−Y/B−Y Y: Composite, 1.0 Vp-p ±6 dB, high impedance, loop-through R−Y/B−Y: 0.7 Vp-p ±6 dB, high impedance, loop-through
Sync	EXT SYNC 1-8 Vp-p negative, high impedance, with loop-through output
Return loss	More than 46 dB (7 MHz with 75-ohm termination)
Hum rejection	Reduced by more than 50 dB Maximum hum: Less than 4 Vrms, where hum is applied the to monitor in floating ground mode

Output

Connectors	DECODER OUT: BNC type (3) (output decoded signals only when BKM-1440 is installed.) REMOTE: 10-pin connector (1)

---

* The input level of a component signal conforms to the EBU "N-10" standard. (Only for the BVM-2015P)

Video signal

Luminance channel (RGB and composite signals)	
Differential gain	Within 5 % for a luminance from 0 to 30 fL
Differential phase	Within 5° for a luminance from 0 to 30 fL
Frequency response	Monochrome mode: 100 Hz to 6 MHz ± 1 dB (aperture correction at 0) Color mode: Trap filter removes frequency in 4.43 MHz region (BVM-2015P) or 3.58 MHz region (BVM-1915/2015PM) RGB mode: 100 Hz to 6 MHz ± 1 dB
Chrominance channel	
Demodulation axis	R−Y/B−Y
Bandpass	1.3 MHz equiband
Subcarrier regeneration	± 1° (standard input signal)
Phase control range	More than ± 15° (standard input signal)
Chroma gain control range	More than ± 6 dB
Chrominance/luminance	
Time error	Less than 30 nsec
Gain error	Less than 5 %
Aperture correction	Adjustable continuously up to 6 dB boost at 4.5 MHz or 6.5 MHz (selectable)
DC restoration (RGB and composite signals)	Back porch type Back porch level: Within 1 % of peak luminance, 10 % to 90 % APL (average picture level)

Synchronization

AFC time constant	0.5 msec: FAST 2 msec: NORMAL 7 msec: SLOW
Line pull range/line hold range	More than ± 500 Hz at 0.5 msec time constant
Vertical blanking time	Normal: Within 1 msec. Underscan: Within 0.8 msec.
Horizontal retrace time	Within 10 μsec.

Picture performance

Normal scan	5 % overscan of CRT effective screen area (adjustable range more than ± 15 %)
Underscan	3 % underscan of CRT effective screen area (adjustable range more than ± 15 %)
Linearity	Within a central area bounded by a circle whose diameter equals the picture height, within 1 % of the picture height, out of area 2 %
Color temperature	D6500, adjustable to other color temperatures
Nominal chromaticity coordinates	BVM-1915 SMPTE C phosphor

	X	Y
Red	0.630	0.340
Green	0.310	0.595
Blue	0.155	0.070

BVM-2015P/2015PM
EBU standard phosphor

	X	Y
Red	0.64	0.33
Green	0.29	0.60
Blue	0.15	0.06

Convergence error	Central area: Less than 0.5 mm Periphery: Less than 1.0 mm
Calibrated constant	30 fL at peak white of standard 1 Vp-p signal
Raster size stability	Less than 1 % picture height, 0 % to 100 % APL at 30 fL peak luminance
Scan delay	Horizontal: Approx. $^{1}/_{4}$ line Vertical: Approx. $^{1}/_{2}$ field
Resolution	More than 600 TV lines (center, at 30 fL luminance)

Environment

Operating temperature	0 to 40°C (32 to 104°F)
Optimum temperature range	20 to 30°C (68 to 86°F)
Humidity	0 to 90 %
Altitude	Approx. 3,050 m (10,000 feet)

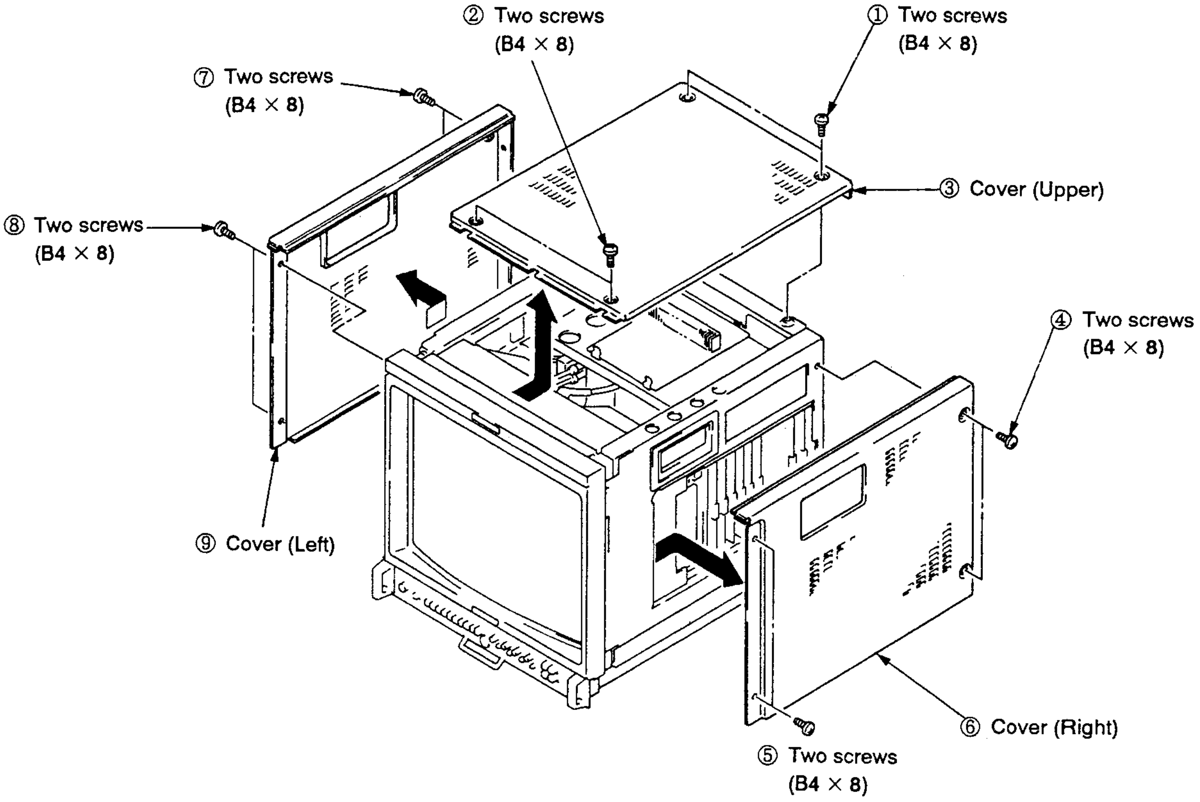
General

Picture tube protection	EHT (Extremely High Tension) is shut off in the event of scan failure.
Warm up	30 minutes to meet specifications
Anode voltage	Properly adjusted HV 27 kV at zero beam current
Power consumption	**BVM-1915** 100 - 120V AC 3.1A **BVM-2015P/PM** 220 - 240V AC 1.7A
Power requirements	200-240 or 100-120 V AC ±10 %, adjustable, 50/60 Hz
Dimensions	448 × 455 × 584 mm (w/h/d) ($17^{3}/_{4}$ × 18 × 23 inches) incl. projecting parts and controls
Weight	40.3 kg (88 lb 22 oz)
Supplied accessories	AC power cord (1) Cord stopper (1) Screwdriver (1) Drawer keys (2) Extension board (1) 10-pin connector (1) Fuses (3) Tally number plates (1 set) Operation and maintenance manual (1)

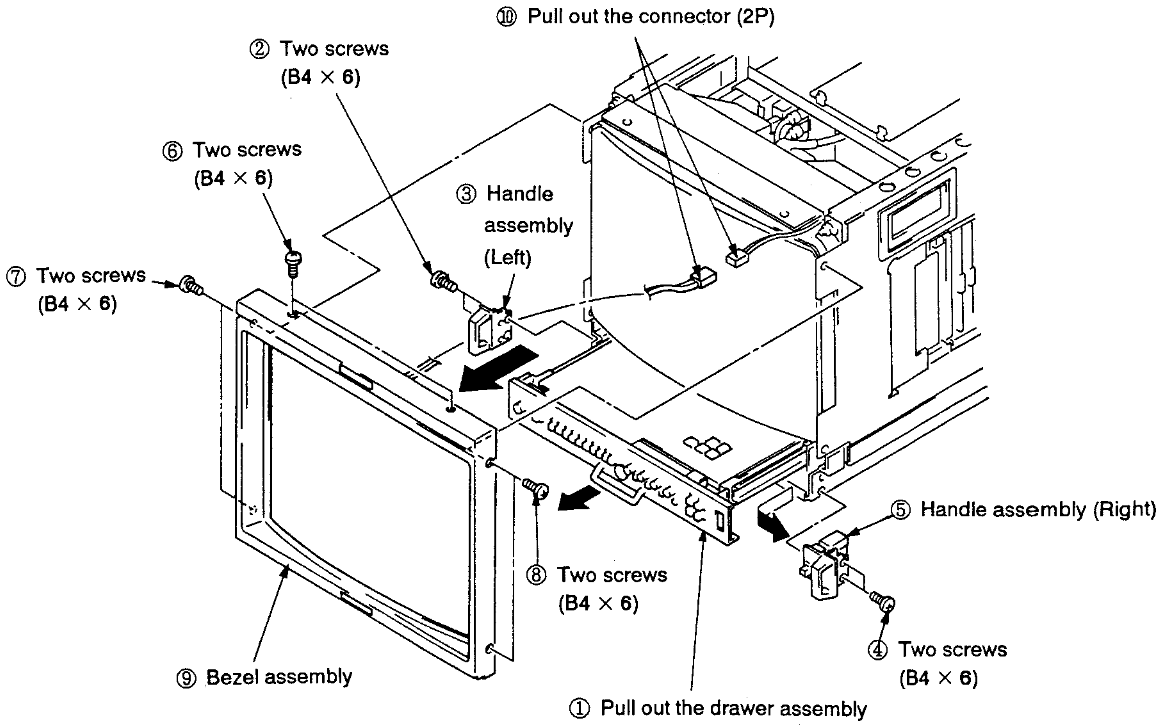
Design and specifications are subject to change without notice.

SECTION 2
DISASSEMBLY

2-1. COVER REMOVAL

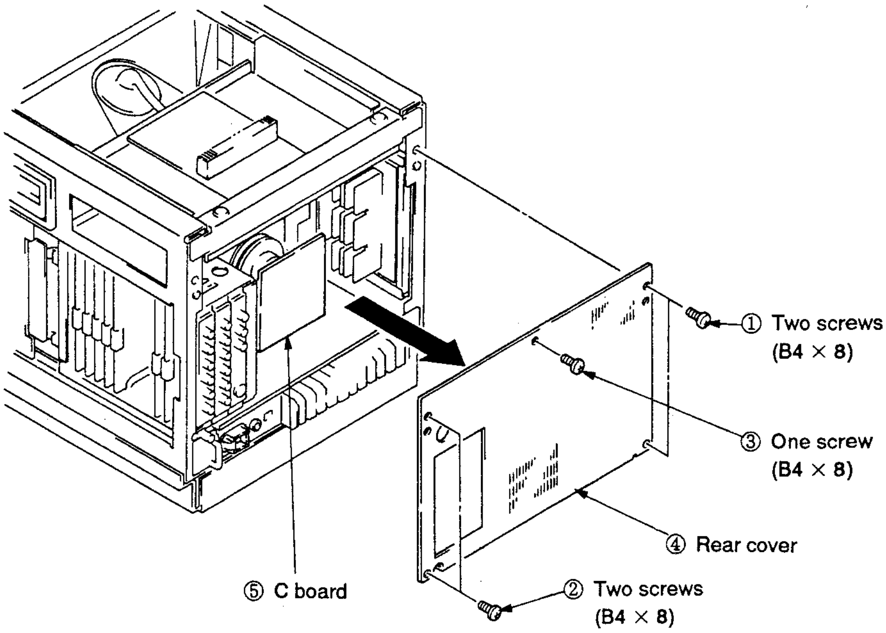

② Two screws
(B4 × 8)
① Two screws
(B4 × 8)
⑦ Two screws
(B4 × 8)
③ Cover (Upper)
⑧ Two screws
(B4 × 8)
④ Two screws
(B4 × 8)
⑨ Cover (Left)
⑥ Cover (Right)
⑤ Two screws
(B4 × 8)

2-2. BEZEL ASSEMBLY REMOVAL


⑩ Pull out the connector (2P)
② Two screws
(B4 × 6)
⑥ Two screws
(B4 × 6)
③ Handle
assembly
(Left)
⑦ Two screws
(B4 × 6)
⑤ Handle assembly (Right)
⑧ Two screws
(B4 × 6)
④ Two screws
(B4 × 6)
⑨ Bezel assembly
① Pull out the drawer assembly

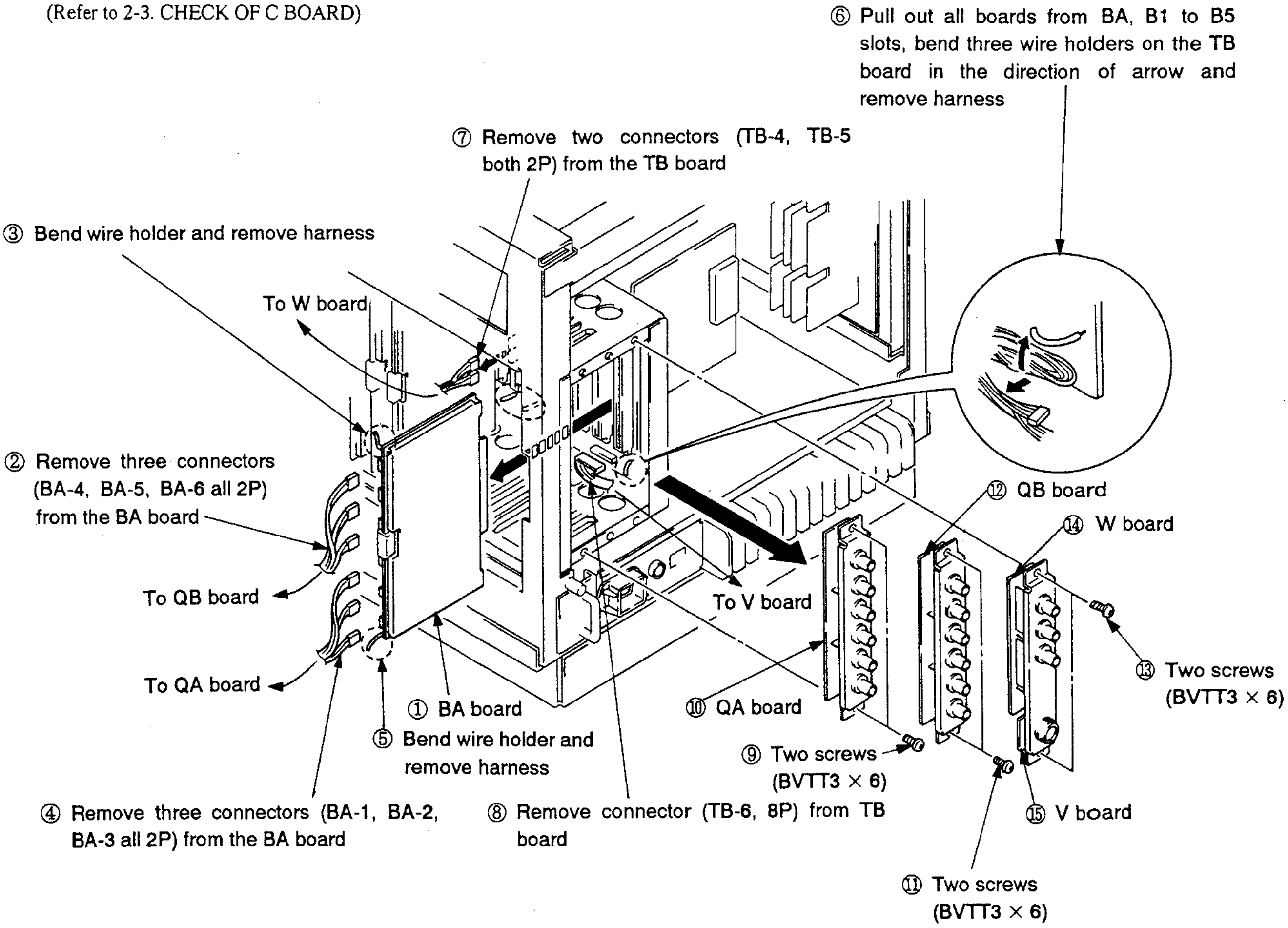
2-3. CHECK OF C BOARD

Note: Do it after removing cover (Right, Left)
(Refer to 2-1. COVER REMOVAL)

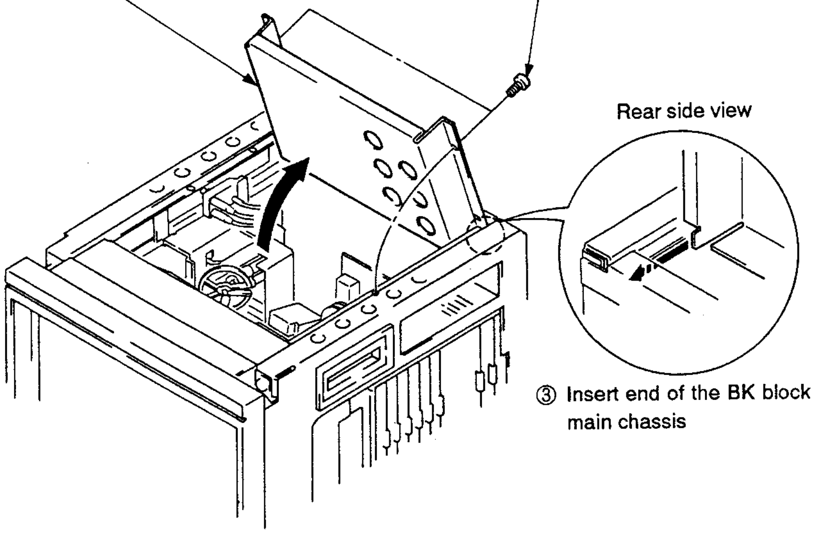

① Two screws (B4 × 8)
③ One screw (B4 × 8)
④ Rear cover
⑤ C board
② Two screws (B4 × 8)

2-4. QA, QB, W AND V BOARDS REMOVAL

Note: Do it after removing rear cover.
(Refer to 2-3. CHECK OF C BOARD)


⑥ Pull out all boards from BA, B1 to B5 slots, bend three wire holders on the TB board in the direction of arrow and remove harness
⑦ Remove two connectors (TB-4, TB-5 both 2P) from the TB board
③ Bend wire holder and remove harness
To W board
② Remove three connectors (BA-4, BA-5, BA-6 all 2P) from the BA board
⑫ QB board
⑭ W board
To QB board
To V board
To QA board
⑬ Two screws (BVTT3 × 6)
① BA board
⑩ QA board
⑤ Bend wire holder and remove harness
⑨ Two screws (BVTT3 × 6)
④ Remove three connectors (BA-1, BA-2, BA-3 all 2P) from the BA board
⑧ Remove connector (TB-6, 8P) from TB board
⑮ V board
⑪ Two screws (BVTT3 × 6)

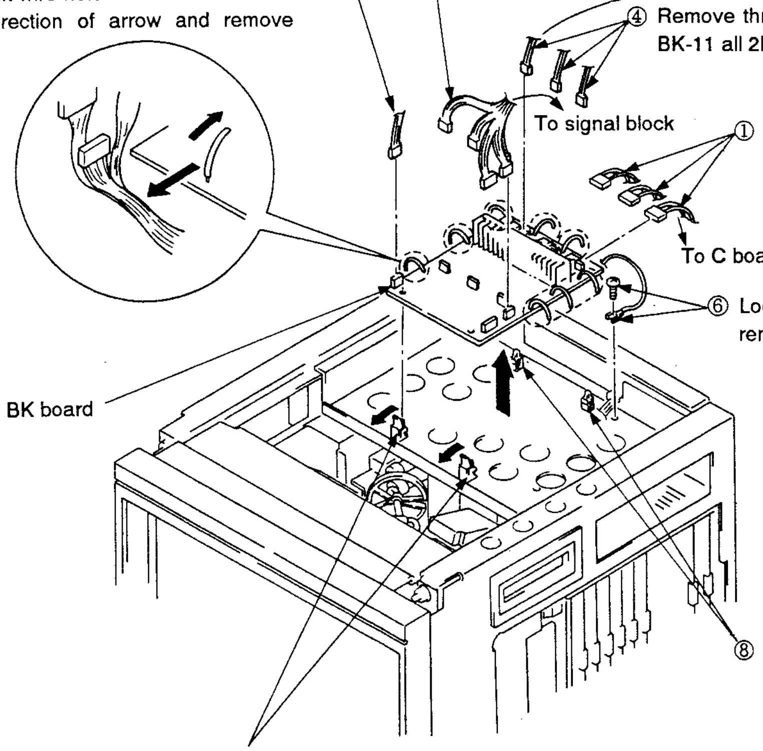
2-5. OPEN THE BK BLOCK


② BK block
Rear side view

① Two screws (B4 × 8)

③ Insert end of the BK block chassis to the main chassis

2-6. BK BOARD REMOVAL


To signal block
To signal block
To C board
⑨ BK board

① Remove three connectors (BK-6, BK-7, BK-8, all 4P) from the BK board

② Bend eight wire holders on the BK board in the direction of arrow and remove harness

③ Remove five connectors (BK-1, BK-2, BK-3, BK-5 all 4P, BK-4 3P) from the BK board

④ Remove three connectors (BK-9, BK-10, BK-11 all 2P) from the BK board

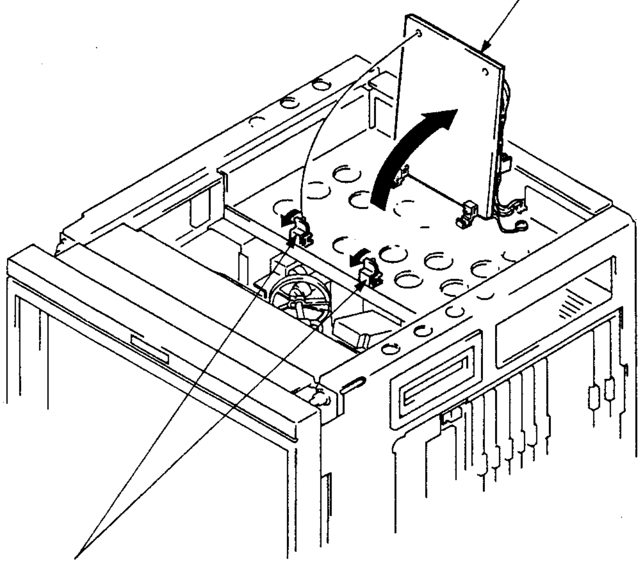
⑤ Remove connector (BK-12 4P) from BK board

⑥ Loosen a screw (BVTT3 × 6) and remove ground terminal

⑦ Remove two claws of PCB holders in the direction of arrow

⑧ Remove two claws of PCB holders

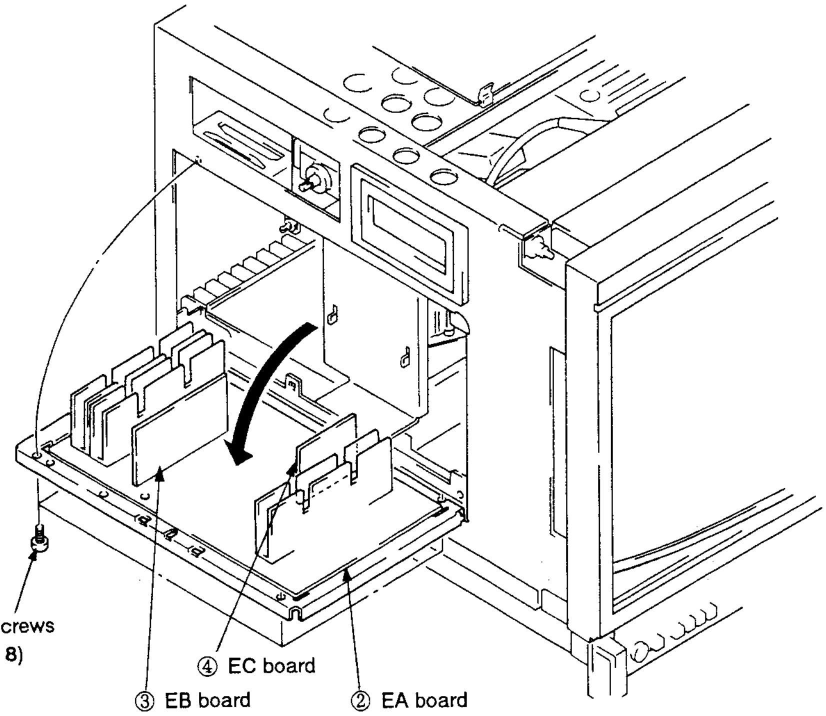
2-7. CHECK OF BK BOARD



② Open the BK board as shown by arrow

① Remove two claws of PCB holders in the direction of arrow

2-8. CHECK OF EA, EB AND EC BOARDS



① Four screws (B4 × 8)

④ EC board

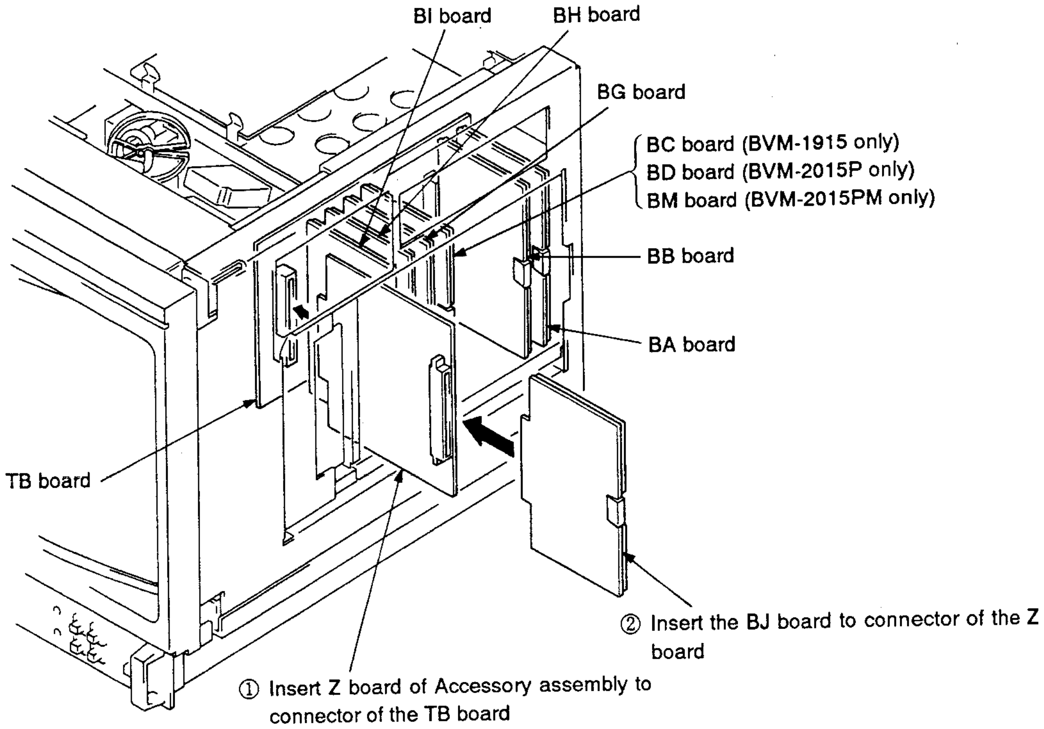
③ EB board

② EA board

2-9. CHECK OF BJ BOARD

Note: PC board retainer is attach as anti-detach jig for the board.
Remove the PC board retainer before checking.

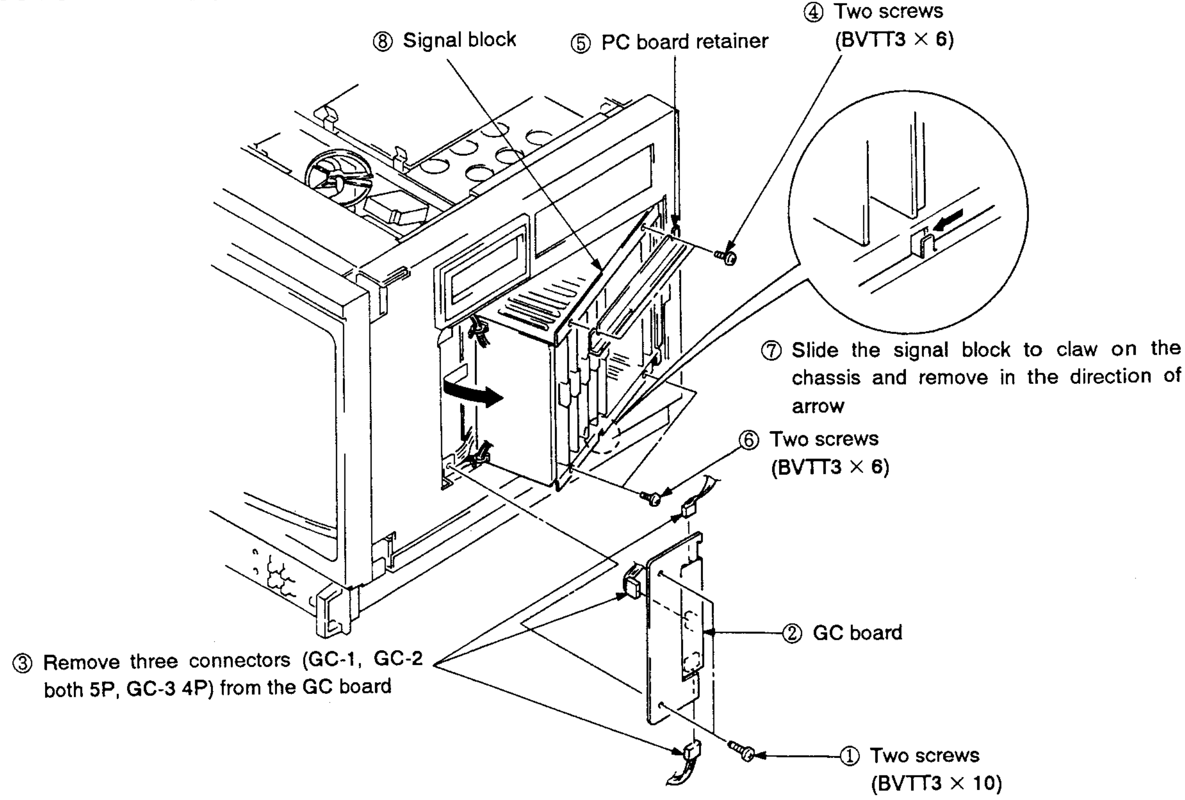
Note: BA, BB, BC, BD, BM BG, BH and BI boards can be checked similarly.


BI board
BH board
BG board
BC board (BVM-1915 only)
BD board (BVM-2015P only)
BM board (BVM-2015PM only)
BB board
BA board
TB board

② Insert the BJ board to connector of the Z board

① Insert Z board of Accessory assembly to connector of the TB board

2-10. GC BOARD AND SIGNAL BLOCK REMOVAL


⑧ Signal block
⑤ PC board retainer
② GC board

④ Two screws (BVTT3 × 6)

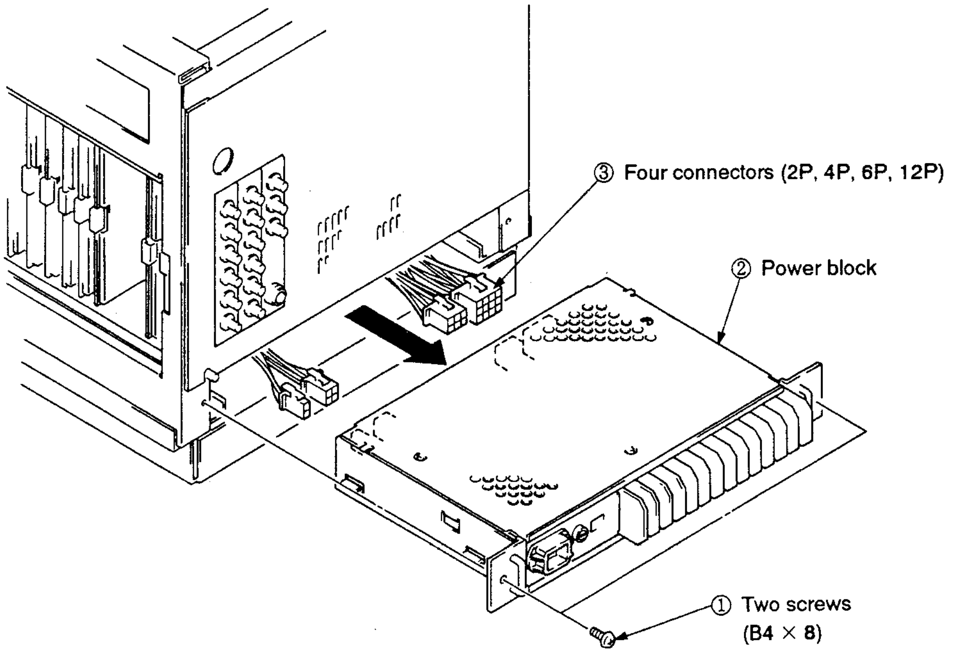
⑦ Slide the signal block to claw on the chassis and remove in the direction of arrow

⑥ Two screws (BVTT3 × 6)

③ Remove three connectors (GC-1, GC-2 both 5P, GC-3 4P) from the GC board

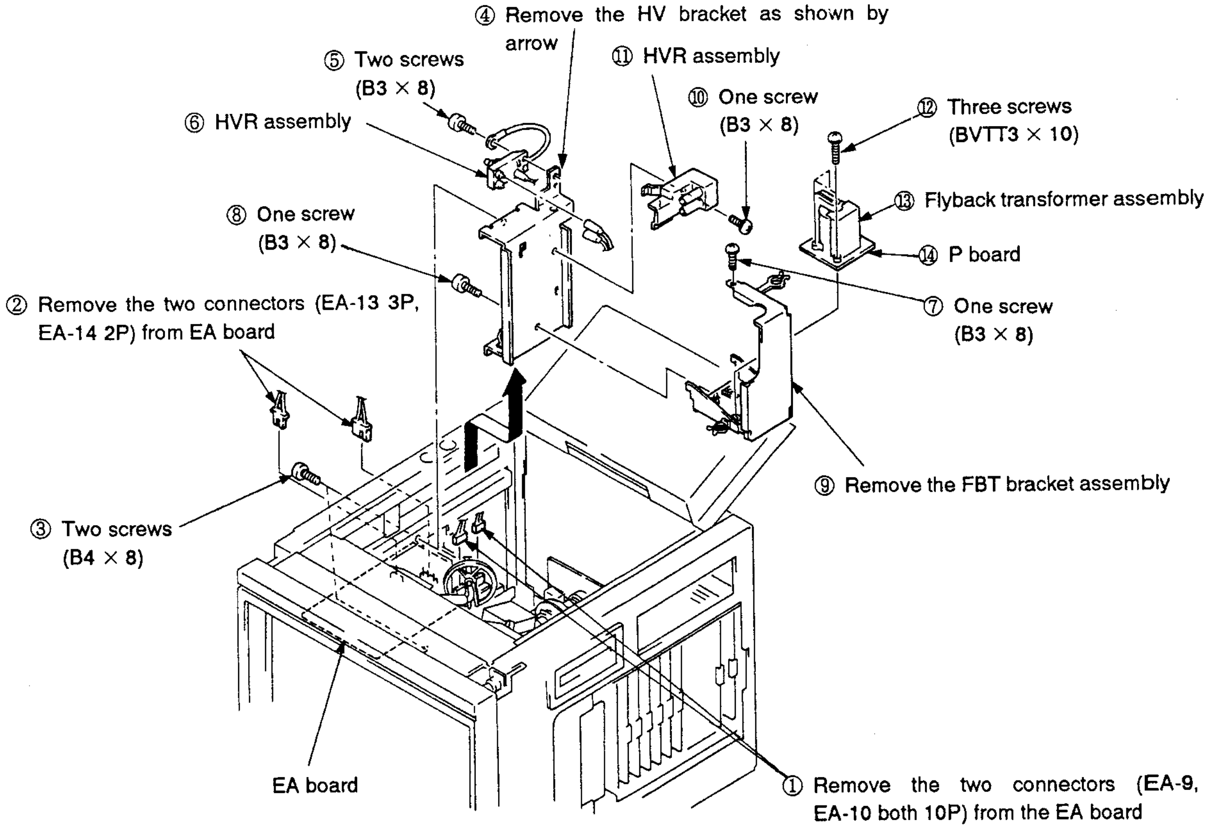
① Two screws (BVTT3 × 10)

2-11. POWER BLOCK ASSEMBLY REMOVAL

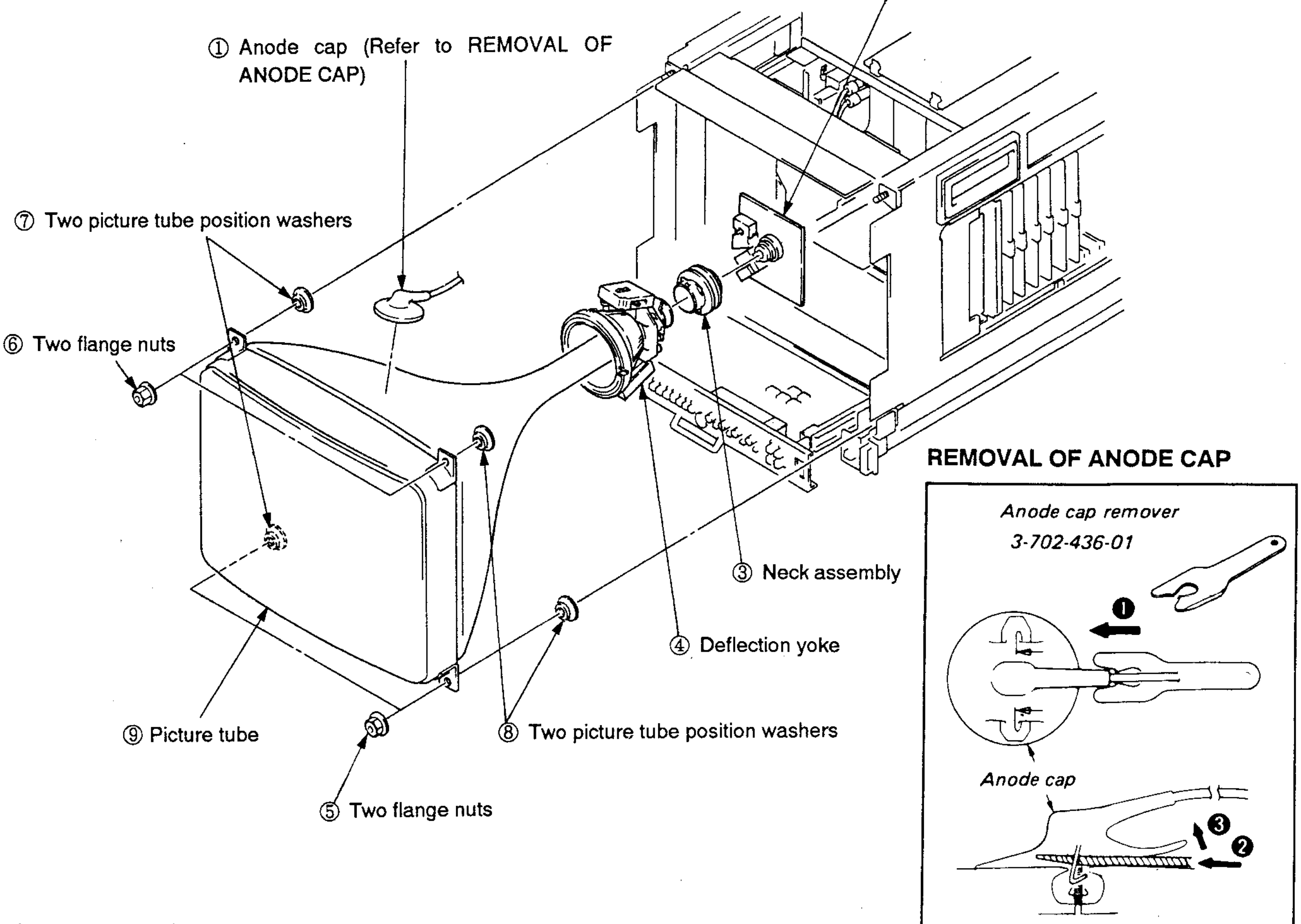

③ Four connectors (2P, 4P, 6P, 12P)
② Power block
① Two screws
(B4 × 8)

2-12. FLYBACK TRANSFORMER AND HIGH VOLTAGE BLOCK ASSEMBLY REMOVAL

Note: Do it after opening EA board.
(Refer to 2-8. CHECK OF EA, EB AND EC BOARDS)


④ Remove the HV bracket as shown by arrow
⑤ Two screws
(B3 × 8)
⑪ HVR assembly
⑩ One screw
(B3 × 8)
⑫ Three screws
(BVTT3 × 10)
⑥ HVR assembly
⑬ Flyback transformer assembly
⑧ One screw
(B3 × 8)
⑭ P board
⑦ One screw
(B3 × 8)
② Remove the two connectors (EA-13 3P, EA-14 2P) from EA board
⑨ Remove the FBT bracket assembly
③ Two screws
(B4 × 8)
EA board
① Remove the two connectors (EA-9, EA-10 both 10P) from the EA board

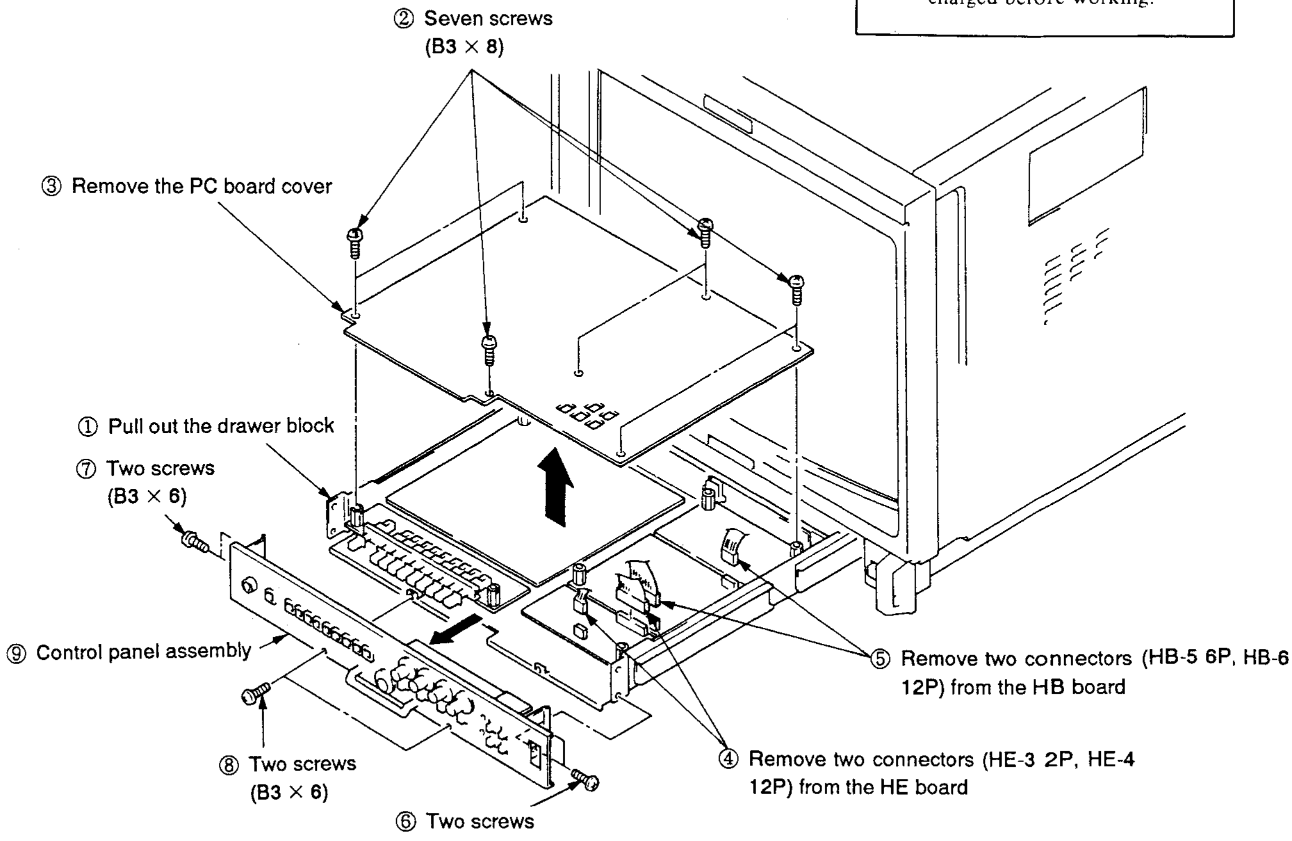
2-13. PICTURE TUBE REMOVAL


② C board
① Anode cap (Refer to REMOVAL OF ANODE CAP)
⑦ Two picture tube position washers
⑥ Two flange nuts
③ Neck assembly
④ Deflection yoke
⑨ Picture tube
⑧ Two picture tube position washers
⑤ Two flange nuts
Anode cap remover
3-702-436-01
❶
Anode cap
❸
❷

REMOVAL OF ANODE CAP

Note: Be sure to have the cap discharged before working.

2-14. CONTROL PANEL ASSEMBLY REMOVAL


② Seven screws (B3 × 8)
③ Remove the PC board cover
① Pull out the drawer block
⑦ Two screws (B3 × 6)
⑨ Control panel assembly
⑤ Remove two connectors (HB-5 6P, HB-6 12P) from the HB board
④ Remove two connectors (HE-3 2P, HE-4 12P) from the HE board
⑧ Two screws (B3 × 6)
⑥ Two screws (B3 × 6)

SECTION 3
CIRCUIT DESCRIPTIONS

3-1. QA, QB, BA BOARDS

3-1-1. Input Circuit

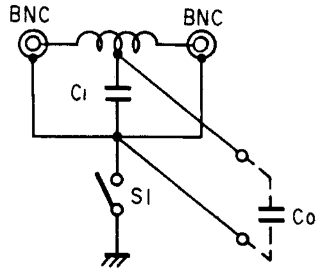
Cable Compensation (QA, QB)

CABLE COMPENSATION is composed of inductance L and capacitor C1 (Figure 1) in QA board and performs return loss compensation.

Grounding or floating in input terminal can be selected by switch S1.

On floating mode, common mode rejection can be performed.

QB board also has same function.



BNC
BNC
C1
S1
Co

Figure 1

Hook Up Circuit (BA)

This circuit is composed of transistors Q101-105 and performs common mode rejection when SW S1 is selected to the floating mode.

In Figure 2, Gains of amplifier for input A and B are derived as follows.

$A = \frac{Rc}{Ri}$: Gain of amplifier for input A

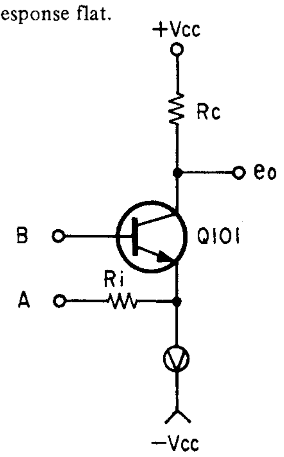
$B = -\frac{Rc}{Ri}$: Gain of amplifier for input B

When input (ec + ei) is applied to input A and
input (ec − ei) to input B, then output eo is

$$eo = \frac{Rc}{Ri}(ec + ei) + (-\frac{Rc}{Ri})(ec - ei) = 2\frac{Rc}{Ri}ei$$

This equation indicates that ec is eliminated and there is no common mode signal in output signal.

On hook up circuit, NF Amplifier (Negative Feedback) is used to get frequency response flat.



+Vcc
Rc
eo
B
Q101
Ri
A
−Vcc

Figure 2

Input Select Sw, Sync Select SW (BA)

For composite video signal, VIDEO A/B/TEST mode is selected by INPUT SELECT SW (IC1). For sync signal, INT SYNC/EXT SYNC is selected by SYNC SELECT SW IC2.

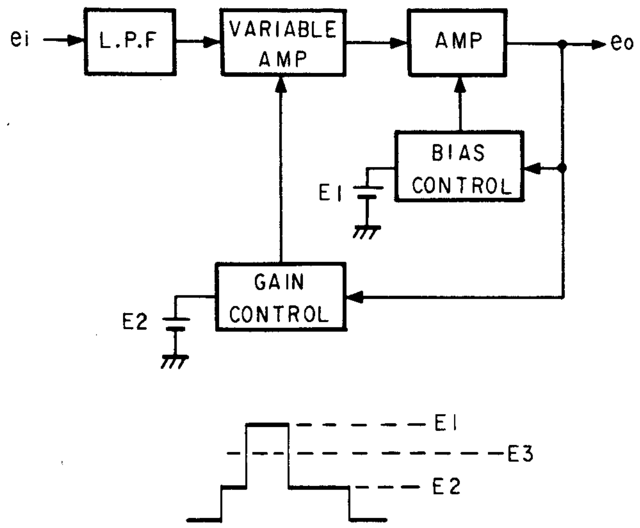
3-1-2. Sync AGC Circuit

This circuit is composed of following components; LPF (Low Pass Filter) (Q701), variable gain amplifier (Q702-Q705), bias control circuit (Q708-Q710), gain control circuit (Q711, 712) and amplifier (Q706, 707). Figure 3 shows block diagram of this circuit.

An inverted composite video signal or composite sync signal (eo) is derived at the collector of transistor Q707.

The bias control circuit compares maximum value of eo with base voltage of Q708 (E1) and controls bias of amplifier so that they match.

Also the gain control circuit compares pedestal level of eo with base voltage of Q711 (E2), and controls variable gain amplifier so that they match.



ei
L.P.F
VARIABLE AMP
AMP
eo
BIAS CONTROL
E1
GAIN CONTROL
E2
E1
E3
E2

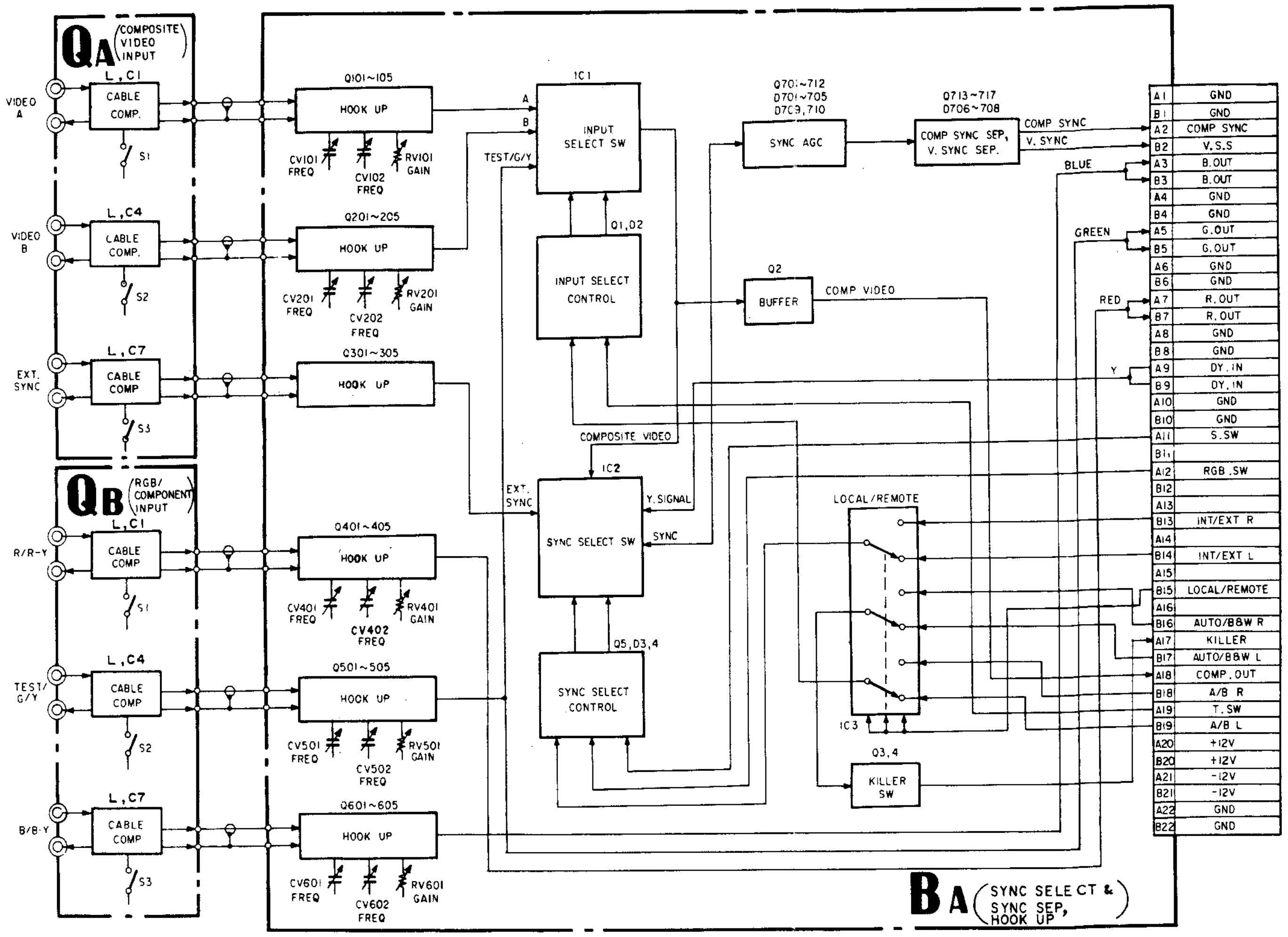
Figure 3

Composite Sync Separation, Vertical Sync Separation

Composite sync is separated from composite video signal or composite sync by comparing voltage eo with the base voltage of transistor Q713 (E3).

Horizontal component in composite video signal or composite sync signal is removed by LPF (Low Pass Filter, Q716) and Vertical sync is separated by transistor Q717.

BLOCK DIAGRAM OF QA, QB, BA BOARDS



QA (COMPOSITE VIDEO INPUT)
VIDEO A
VIDEO B
EXT. SYNC
L, C1
L, C4
L, C7
CABLE COMP.
S1
S2
S3
QB (RGB/COMPONENT INPUT)
R/R-Y
TEST/G/Y
B/B-Y
Q101~105
Q201~205
Q301~305
Q401~405
Q501~505
Q601~605
HOOK UP
CV101 FREQ
CV102 FREQ
RV101 GAIN
CV201 FREQ
CV202 FREQ
RV201 GAIN
CV401 FREQ
CV402 FREQ
RV401 GAIN
CV501 FREQ
CV502 FREQ
RV501 GAIN
CV601 FREQ
CV602 FREQ
RV601 GAIN
IC1
A
B
TEST/G/Y
INPUT SELECT SW
Q1, D2
INPUT SELECT CONTROL
COMPOSITE VIDEO
IC2
EXT. SYNC
Y. SIGNAL
SYNC
SYNC SELECT SW
Q5, D3, 4
SYNC SELECT CONTROL
Q701~712
D701~705
D709, 710
SYNC AGC
Q713~717
D706~708
COMP SYNC SEP, V. SYNC SEP.
COMP SYNC
V. SYNC
Q2
BUFFER
COMP VIDEO
BLUE
GREEN
RED
Y
LOCAL/REMOTE
IC3
Q3, 4
KILLER SW
BA (SYNC SELECT & SYNC SEP, HOOK UP)
A1 GND
B1 GND
A2 COMP SYNC
B2 V.S.S
A3 B.OUT
B3 B.OUT
A4 GND
B4 GND
A5 G.OUT
B5 G.OUT
A6 GND
B6 GND
A7 R.OUT
B7 R.OUT
A8 GND
B8 GND
A9 DY.IN
B9 DY.IN
A10 GND
B10 GND
A11 S.SW
B11
A12 RGB.SW
B12
A13
B13 INT/EXT R
A14
B14 INT/EXT L
A15
B15 LOCAL/REMOTE
A16
B16 AUTO/B&W R
A17 KILLER
B17 AUTO/B&W L
A18 COMP.OUT
B18 A/B R
A19 T.SW
B19 A/B L
A20 +12V
B20 +12V
A21 −12V
B21 −12V
A22 GND
B22 GND

3-2. BG BOARD

3-2-1. Luminance Signal Circuit

Filter SW

IC1 works as a selector switch of composite video signal or luminance signal derived from Y/C separation circuit. This IC activates by either FILTER-SW in right side drawer or killer signal.

Aperture Control

Aperture control circuit is composed of DL1(delay line), transistors Q5, 7, 8 and IC2. IC2 operates as a variable resistor. Resistance value between Pin①and③is controlled by the potential between pin ③ and pin ④, also pin ① and pin⑥.

Input signal: e_{T0},
Delayed signal by delay line: e_{T1}
Second delayed signal: e_{T2}

See Figure 4
e_1 (at base of transistor Q5) is obtained as below due to the combination of direct wave and reflected wave by DL1.

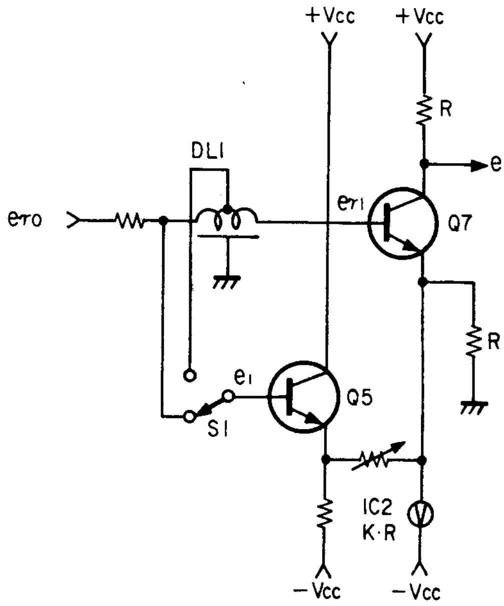

+Vcc
+Vcc
R
DLI
eo
eTO
eT1
Q7
R
e1
Q5
S1
IC2
K·R
-Vcc
-Vcc

Figure 4

$e_1 = (e_{T0} + e_{T2})/2$

Therefore eo is

$$e_o = \underbrace{-(e_{T1}}_{\text{1st term}} + \underbrace{\frac{1}{K}(e_{T1} - \frac{1}{2}(e_{T0} + e_{T2}))}_{\text{2nd term}})$$

K: variable constant

In the above equation, 1st term shows waveform A in Figure 5 and 2nd term shows waveform B. When K is variable, amount of preshoot and overshoot can be varied.
Switch S1 is used for selection of boost frequency.

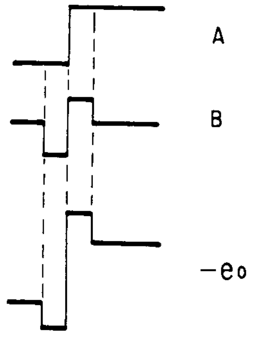


Figure 5

Y Delay, Y Buffer Amplifier

Y/C delay time can be matched by delay line DL2 and Y signal is amplified and fed to the next stage.

3-2-2. Color Gain Control Circuit

In this section (R-Y) signal processing is described as below, but (B-Y) signal is processed by the same way as (R-Y) signal.

R-Y Amplifier and Clamping

The R-Y color difference signal from the decoder board is amplified at the amplifier composed of transistors Q21 and Q22 and clamped at the Horizontal Sync by transistors Q23 and IC3.

R-Y Gain Control Amplifiter

This is a variable gain control amplifier composed of variable resistor element of IC4 and transistors Q25-Q27. Gain of this amplifier can be controlled by the color gain control voltage at the pin ⑫ of IC4.

AGC Pulse Generator

Generates the reference pulse for AGC (Automatic Gain Control) of color gain control circuit.

Gain Control Amplifier for AGC Pulse

Circuit is the same as R-Y GAIN CONTROL AMPLIFIER. Gain of this amplifier is controlled by the voltage at pin ⑧ of IC4.

Color Gain Control

AGC pulse, which is output signal of Gain control amplifier for AGC pulse, is clamped by IC6 (2/3) and is made sampling by IC6 (3/3). Amplitude of AGC pulse and DC voltage supplied from CHROMA control on the front panel are compared and matched by IC7 (1/2) with controlling the above gain control amplifier. This control voltage is supplied to the control terminals of R-Y and B-Y gain control amplifiers and controls color gain.

3-2-3. G-Y MATRIX amplifier

G-Y signal is obtained by matrixing R-Y signal and B-Y signal with the amplifier composed of transistors Q44 and Q45.

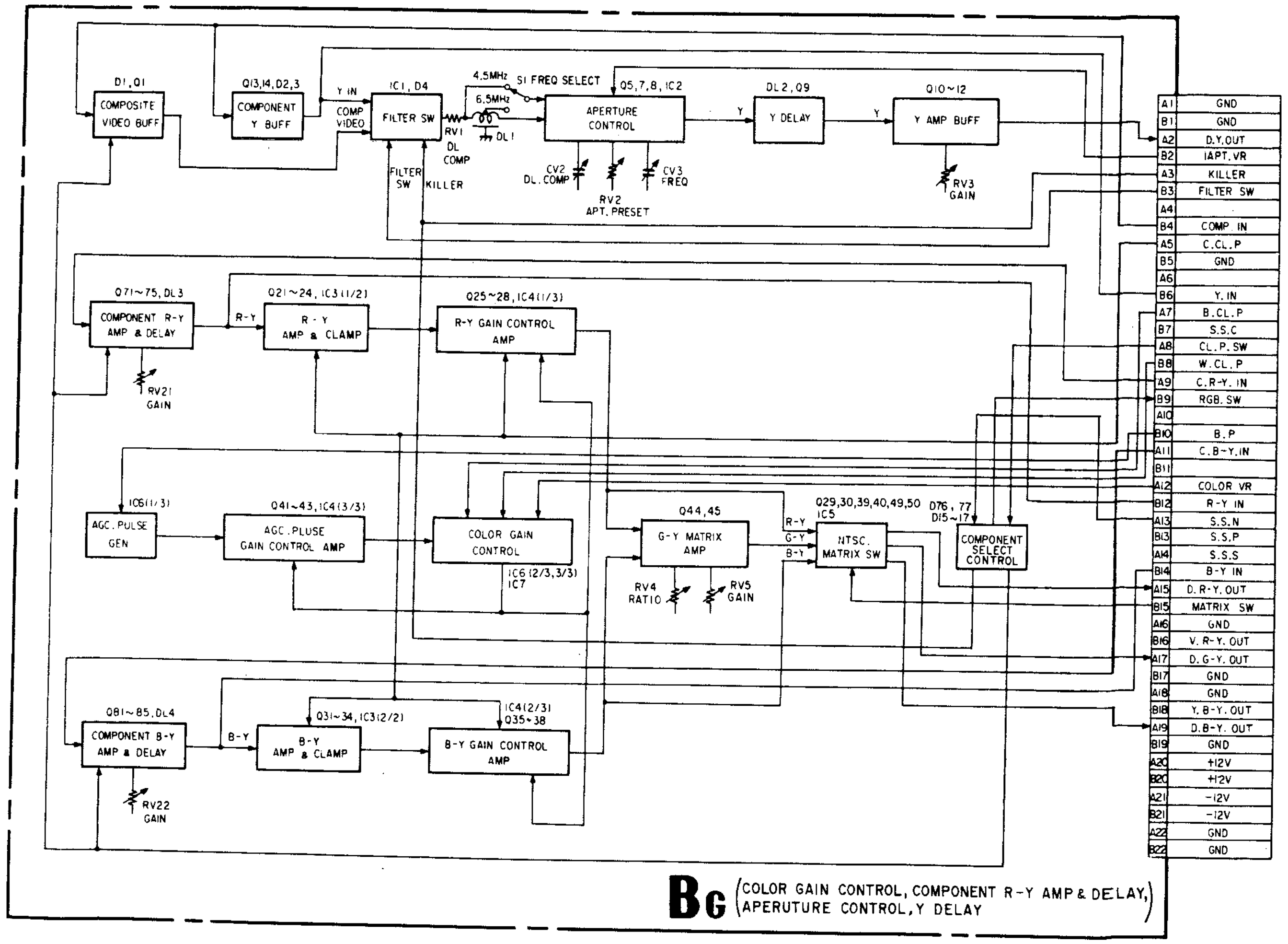
3-2-4. NTSC MATRIX SW

NTSC MATRIX mode operation is obtained by the matrix circuit composed of resistor networks CP14-CP19, transistor Q29, Q30, Q39, Q40, Q49, Q50 and IC5. CP14-CP19 perform matrixing and IC5 works as a switch.

3-2-5. COMPONENT R-Y Amplifier and Delay Circuit

R-Y signal of COMPONENT signal is compensated with amplitude, porality and delay time to match the R-Y signal of decoder output.

BLOCK DIAGRAM OF BG BOARD


D1, Q1
COMPOSITE VIDEO BUFF
Q13,14, D2,3
COMPONENT Y BUFF
Y IN
COMP VIDEO
IC1, D4
FILTER SW
RV1 DL COMP
4.5MHz
6.5MHz
S1 FREQ SELECT
DL1
Q5,7,8, IC2
APERTURE CONTROL
CV2 DL.COMP
RV2 APT. PRESET
CV3 FREQ
FILTER SW
KILLER
Y
DL2, Q9
Y DELAY
Y
Q10~12
Y AMP BUFF
RV3 GAIN
Q71~75, DL3
COMPONENT R-Y AMP & DELAY
RV21 GAIN
R-Y
Q21~24, IC3(1/2)
R-Y AMP & CLAMP
Q25~28, IC4(1/3)
R-Y GAIN CONTROL AMP
IC6(1/3)
AGC. PULSE GEN
Q41~43, IC4(3/3)
AGC. PLUSE GAIN CONTROL AMP
COLOR GAIN CONTROL
IC6 (2/3, 3/3) IC7
Q44,45
G-Y MATRIX AMP
RV4 RATIO
RV5 GAIN
R-Y
G-Y
B-Y
Q29,30,39,40,49,50 IC5
NTSC. MATRIX SW
D76, 77 D15~17
COMPONENT SELECT CONTROL
Q81~85, DL4
COMPONENT B-Y AMP & DELAY
RV22 GAIN
B-Y
Q31~34, IC3(2/2)
B-Y AMP & CLAMP
IC4(2/3) Q35~38
B-Y GAIN CONTROL AMP
A1 GND
B1 GND
A2 D.Y.OUT
B2 IAPT.VR
A3 KILLER
B3 FILTER SW
A4
B4 COMP. IN
A5 C.CL.P
B5 GND
A6
B6 Y. IN
A7 B.CL.P
B7 S.S.C
A8 CL.P.SW
B8 W.CL.P
A9 C.R-Y. IN
B9 RGB. SW
A10
B10 B.P
A11 C.B-Y.IN
B11
A12 COLOR VR
B12 R-Y IN
A13 S.S.N
B13 S.S.P
A14 S.S.S
B14 B-Y IN
A15 D.R-Y.OUT
B15 MATRIX SW
A16 GND
B16 V.R-Y.OUT
A17 D.G-Y.OUT
B17 GND
A18 GND
B18 Y.B-Y.OUT
A19 D.B-Y.OUT
B19 GND
A20 +12V
B20 +12V
A21 -12V
B21 -12V
A22 GND
B22 GND
BG (COLOR GAIN CONTROL, COMPONENT R-Y AMP & DELAY, APERUTURE CONTROL, Y DELAY)

3-3. BH BOARD

3-3-1. Switching Circuit Between Y (Luminance) Signal, Color Difference Signal and RGB Signal, AGC Pulse Insertion, Y-C Matrix

Switching Circuit of Y Signal, Crosshatch Signal and SET UP Signal, Buffer

Y signal, crosshatch signal and SET UP signal are selected by the switcher (IC1 (1/3) (2/3)) and selected signal is output via buffer Q1.

Switching Circuit of R-Y Signal, Red Signal and SET UP Signal (Same as B-Y, G-Y Signal)

R-Y signal, Red signal, SET UP signal are selected by IC2 (1/3, 2/3) and selected signal is output via buffer Q4.

Y Signal Screening (Same as R-Y, B-Y, and G-Y Signals)

The signal is performed SAMPLE and HOLD (S/H) at the back porch of signal by transistor Q2 and IC5 (2/2). Y screening is performed by replacing S/H output signal, by the original signal.

For color difference signals screening is made at the Horizontal Sync portion.

Red Matrix, Blue Only SW, Buffer (Same as Green and Blue)

Red is obtained by Y-C matrix circuit composed of resistor network CP9 from color difference signals.

AGC pulse from pulse generator is inserted into Red signal for contrast control.

IC7 activates by the Blue only SW on the front panel. Blue only SW is used for the display of blue signal as a monochrome picture.

3-3-2. Contrast Control, Brightness Control, Peak Limitter

Red Contrast, and Brightness Control Amplifier (Same as Green and Blue)

This is a variable gain control amplifier composed of variable resistor element IC101 and transistor Q102 and Q103. By controlling the voltage at pin ④ of IC101, contrast control is performed, and brightness control is done by controlling the bias voltage of transistor Q102.

Red limitter (Same as Green and Blue)

When excess input signal comes in , amplitude is limitted by the limitter composed of transistors Q104 and Q105.

Red Contrast Control

AGC pulse inserted in Red signal is clamped by transistor Q107 and sampled by transistor Q108.

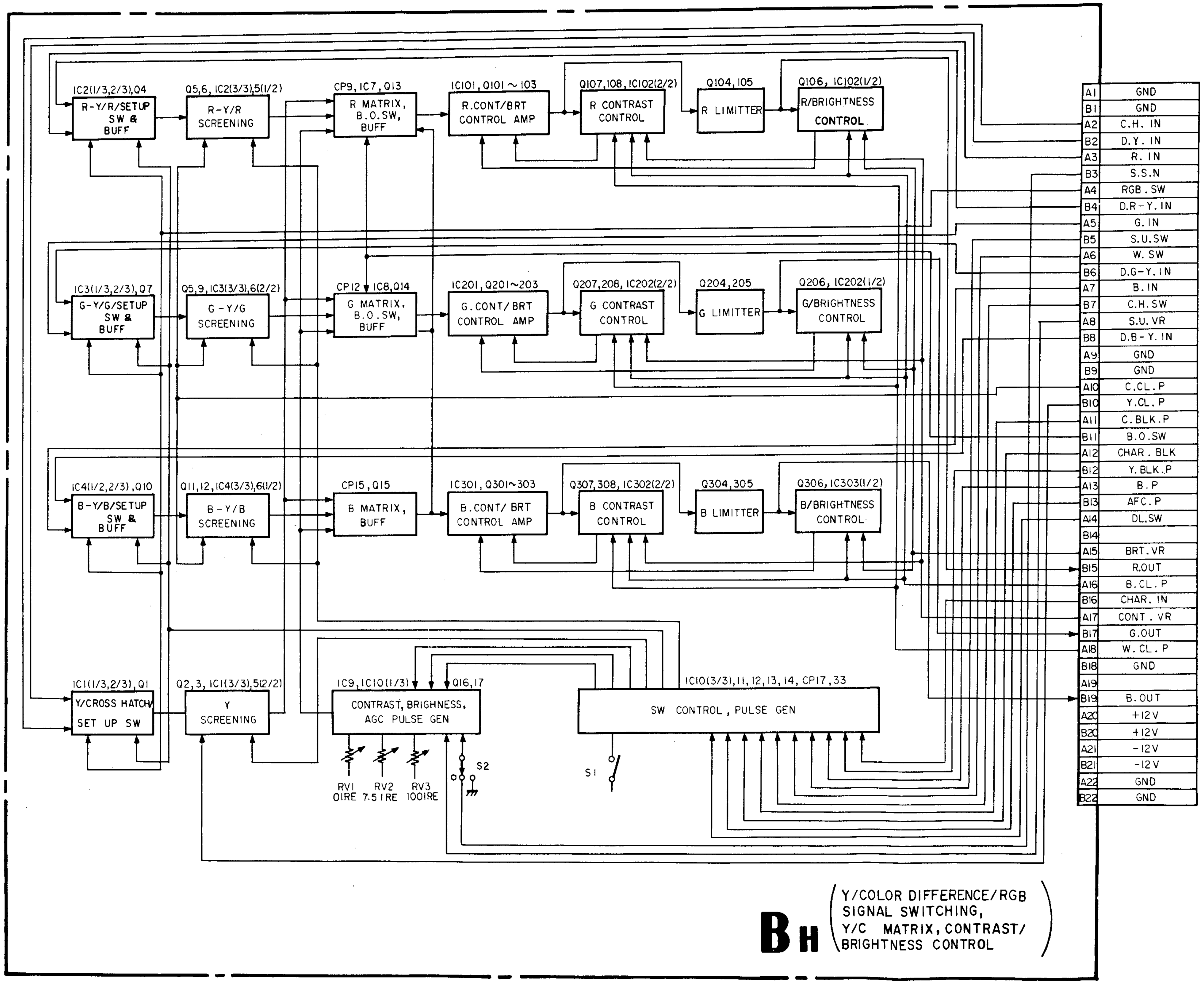
Amplitude of above AGC pulse is compared with the reference voltage applied from CONTRAST control on the front panel in IC102 (2/2).

Contrast control is performed by controlling the gain of Red contrast brightness control amplifier so that these voltages may match.

Red Brightness Control (Same as Green and Blue)

The black level of Red signal is performed SAMPLE and HOLD (S/H) by transistor Q106. This S/H voltage is compared with the reference voltage applied from Brightness control on the front panel in IC102 (1/2). Brightness control is performed by controlling the bias of Red contrast Brightness control amplifier so that these voltages may match.

BLOCK DIAGRAM OF BH BOARD


IC2(1/3,2/3),Q4
R-Y/R/SETUP SW & BUFF
Q5,6, IC2(3/3),5(1/2)
R-Y/R SCREENING
CP9, IC7, Q13
R MATRIX, B.O.SW, BUFF
IC101, Q101 ~ 103
R.CONT/BRT CONTROL AMP
Q107,108, IC102(2/2)
R CONTRAST CONTROL
Q104,105
R LIMITTER
Q106, IC102(1/2)
R/BRIGHTNESS CONTROL
IC3(1/3,2/3),Q7
G-Y/G/SETUP SW & BUFF
Q5,9, IC3(3/3),6(2/2)
G-Y/G SCREENING
CP12, IC8,Q14
G MATRIX, B.O.SW, BUFF
IC201,Q201~203
G.CONT/BRT CONTROL AMP
Q207,208, IC202(2/2)
G CONTRAST CONTROL
Q204,205
G LIMITTER
Q206, IC202(1/2)
G/BRIGHTNESS CONTROL
IC4(1/2,2/3),Q10
B-Y/B/SETUP SW & BUFF
Q11,12,IC4(3/3),6(1/2)
B-Y/B SCREENING
CP15,Q15
B MATRIX, BUFF
IC301,Q301~303
B.CONT/BRT CONTROL AMP
Q307,308, IC302(2/2)
B CONTRAST CONTROL
Q304,305
B LIMITTER
Q306,IC303(1/2)
B/BRIGHTNESS CONTROL
IC1(1/3,2/3),Q1
Y/CROSS HATCH/SET UP SW
Q2,3, IC1(3/3),5(2/2)
Y SCREENING
IC9,IC10(1/3)
Q16,17
CONTRAST, BRIGHNESS, AGC PULSE GEN
RV1 0IRE
RV2 7.5IRE
RV3 100IRE
S2
S1
IC10(3/3),11,12,13,14,CP17,33
SW CONTROL, PULSE GEN
A1 GND
B1 GND
A2 C.H. IN
B2 D.Y. IN
A3 R. IN
B3 S.S.N
A4 RGB . SW
B4 D.R-Y. IN
A5 G. IN
B5 S.U.SW
A6 W. SW
B6 D.G-Y. IN
A7 B. IN
B7 C.H.SW
A8 S.U. VR
B8 D.B-Y. IN
A9 GND
B9 GND
A10 C.CL.P
B10 Y.CL.P
A11 C.BLK.P
B11 B.O.SW
A12 CHAR . BLK
B12 Y. BLK.P
A13 B.P
B13 AFC.P
A14 DL.SW
B14
A15 BRT.VR
B15 R.OUT
A16 B.CL.P
B16 CHAR. IN
A17 CONT . VR
B17 G.OUT
A18 W.CL.P
B18 GND
A19
B19 B.OUT
A20 +12V
B20 +12V
A21 -12V
B21 -12V
A22 GND
B22 GND
BH
Y/COLOR DIFFERENCE/RGB SIGNAL SWITCHING, Y/C MATRIX, CONTRAST/ BRIGHTNESS CONTROL

3-4. BI BOARD

3-4-1. Red Screen SW,AGC Pulse Insertion (Same as Green and Blue)

Red signal can be cut off by RED SCREEN SW on the front panel. Horizontal rate AGC pulse is removed and the reference pulse is inserted in the signal for the GAIN and BIAS adjustment of video output amplifier and for the beam control circuit.

3-4-2. Red Limitter, Gain Bias Control Amplifier

This limitter is used for limiting the excess input level of the signal below 0V DC.

The GAIN/BIAS CONTROL amplifier is composed of variable resistor element and transistors as same as contrast control amplifier' (See section of BH board)

3-4-3. Red Feedback Amplifier, Red Gain Control Red Bias Control Circuit

RED FEEDBACK amplifier inverts the phase of the signal derived from VIDEO OUTPUT amplifier via NF BUFF (Negative Feedback Buffer) in BK board.

The BIAS of VIDEO OUTPUT AMPLIFIER is controlled by RED BIAS CONTROL circuit so that the black level of inverted signal may be 0V DC.

(This time, black level of VIDEO OUTPUT will be -90V DC.)

RED GAIN CONTROL circuit controls the gain of VIDEO OUTPUT AMPLIFIER so that the level of the reference pulse may match to the voltage at pin ③ of IC103.

(When GAIN control (RED) in the drawer is turned, the level of the reference pulse inserted in section 1 changes. And amplitude (Gain) of Red signal changes so that the amplitude of the reference pulse derived from RED FEEDBACK amplifier may be maintained constant by GAIN CONTROL circuit.)

3-4-4. Red Cathode Current Detection, Red Beam Current Control Circuit (I-V Conversion)

Refer to the BK board section of beam control circuit

3-4-5. ABL Detector, Drive Control, Over Drive

The reference level of GAIN CONTROL circuit is controlled by ABL detector and DRIVE CONTROL so that the cathode current of CRT exceeds the predetermined (Preset) value to prevent damage of CRT. OVER DRIVE circuit lights up the OVER LOAD LED on the front panel for warning.

3-4-6. G2 Control Circuit

Circuit diagram of G2 control circuit is shown in Figure 6.

The signal for BM. CURRENT control is fed to base of the transistor Q11 from RED BM. CURRENT control circuit. (Same as G and B)

sistors Q11-Q13 is turned on and is compared with the reference voltage of base voltage Q14.

And this circuit drives transistor Q3, Q2 located in C board so that Transistor Q3, Q2 in C board drives G2 voltage for adjusting cut off level of CRT.

Base voltage of transistor Q14 (reference voltage) is set so that the voltage of Black level at CATHORD electrode may be +120V DC and maintain Ekco (cut off voltage) +120V constant.

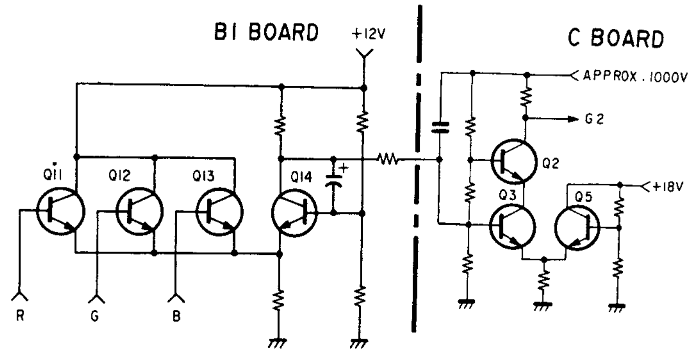
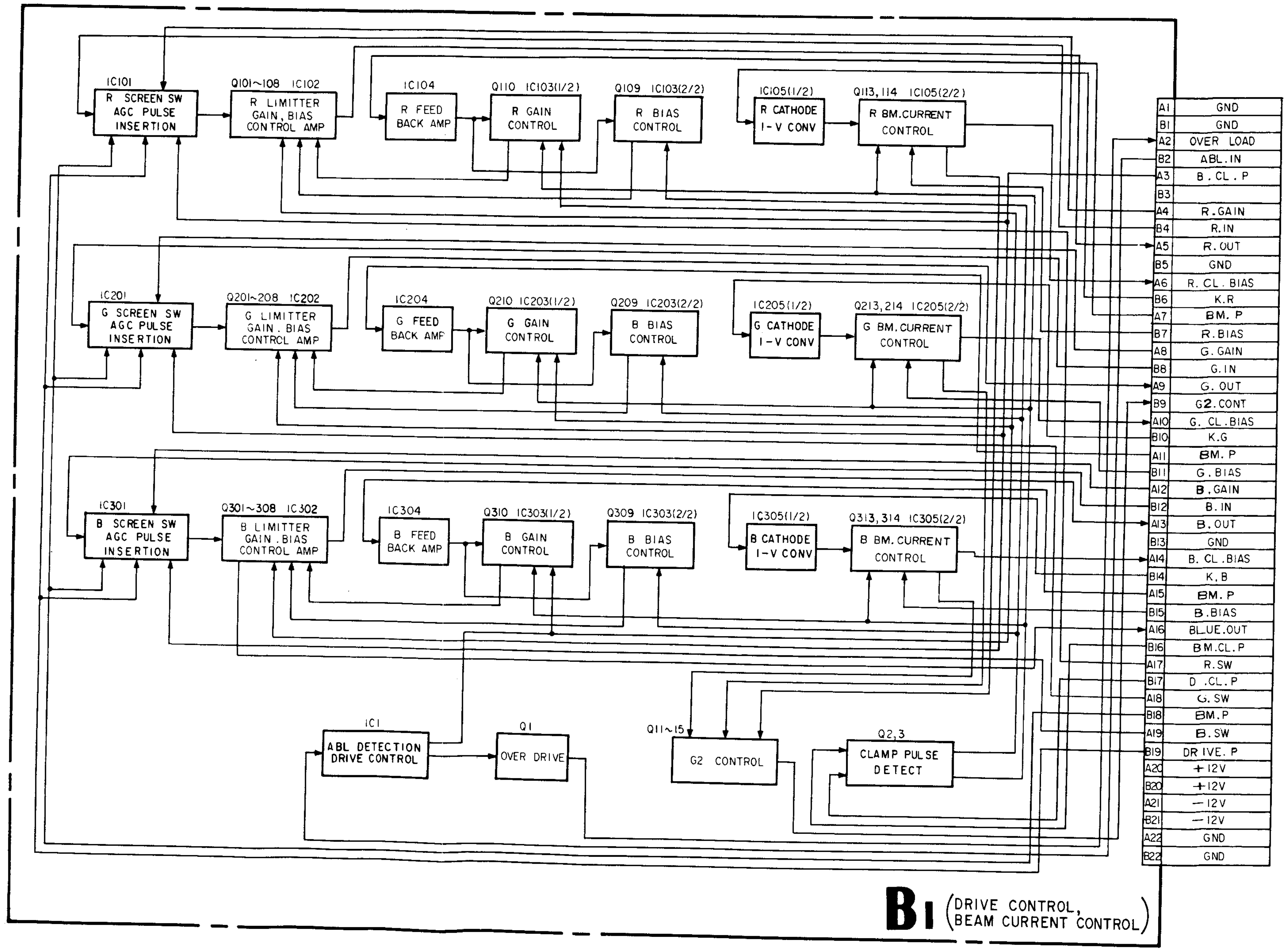

BI BOARD
+12V
C BOARD
APPROX. 1000V
G2
+18V
Q11
Q12
Q13
Q14
Q2
Q3
Q5
R
G
B

Figure 6

BLOCK DIAGRAM OF BI BOARD


IC101
R SCREEN SW AGC PULSE INSERTION
Q101~108 IC102
R LIMITTER GAIN, BIAS CONTROL AMP
IC104
R FEED BACK AMP
Q110 IC103(1/2)
R GAIN CONTROL
Q109 IC103(2/2)
R BIAS CONTROL
IC105(1/2)
R CATHODE I-V CONV
Q113, 114 IC105(2/2)
R BM.CURRENT CONTROL
IC201
G SCREEN SW AGC PULSE INSERTION
Q201~208 IC202
G LIMITTER GAIN. BIAS CONTROL AMP
IC204
G FEED BACK AMP
Q210 IC203(1/2)
G GAIN CONTROL
Q209 IC203(2/2)
B BIAS CONTROL
IC205(1/2)
G CATHODE I-V CONV
Q213, 214 IC205(2/2)
G BM. CURRENT CONTROL
IC301
B SCREEN SW AGC PULSE INSERTION
Q301~308 IC302
B LIMITTER GAIN. BIAS CONTROL AMP
IC304
B FEED BACK AMP
Q310 IC303(1/2)
B GAIN CONTROL
Q309 IC303(2/2)
B BIAS CONTROL
IC305(1/2)
B CATHODE I-V CONV
Q313, 314 IC305(2/2)
B BM. CURRENT CONTROL
IC1
ABL DETECTION DRIVE CONTROL
Q1
OVER DRIVE
Q11~15
G2 CONTROL
Q2,3
CLAMP PULSE DETECT
A1 GND
B1 GND
A2 OVER LOAD
B2 ABL.IN
A3 B.CL.P
B3
A4 R.GAIN
B4 R.IN
A5 R.OUT
B5 GND
A6 R.CL.BIAS
B6 K.R
A7 BM.P
B7 R.BIAS
A8 G.GAIN
B8 G.IN
A9 G.OUT
B9 G2.CONT
A10 G.CL.BIAS
B10 K.G
A11 BM.P
B11 G.BIAS
A12 B.GAIN
B12 B.IN
A13 B.OUT
B13 GND
A14 B.CL.BIAS
B14 K.B
A15 BM.P
B15 B.BIAS
A16 BLUE.OUT
B16 BM.CL.P
A17 R.SW
B17 D.CL.P
A18 G.SW
B18 BM.P
A19 B.SW
B19 DRIVE.P
A20 +12V
B20 +12V
A21 −12V
B21 −12V
A22 GND
B22 GND
BI (DRIVE CONTROL, BEAM CURRENT CONTROL)

3-5. SYNC PROCESSOR, PULSE GENERATOR (BJ BOARD)

3-5-1. 1H Pulse Processing

The composite sync is separated from incoming signal at BA board. And 1H sync is made by separating V sync and equalizing pulse from composite sync.

Also H sync which has constant pulse width is made from 1H sync.

3-5-2. 2fH Multivibrator

This circuit generates 2fH rate pulse from H rate flyback pulse.

3-5-3. Vertical Counter

The 2fH rate pulse is counted down to generate Vertical rate trigger pulse for vertical deflection circuit.

When there is no incoming signal, trigger pulse is generated by vertical counter (384H).

When there is incoming signal with V sync, this counter circuit is reset by V sync and generates trigger pulse synchronized with V sync.

Also in order to increase stability of vertical scanning, noise gating process is made during V sync period.

3-5-4. V Sync and Delay

V sync and V BLANKING pulses are generated by output trigger pulse from vertical counter.

And when V DELAY SW on the front panel is selccted ON, these pulses are generated in a V/2 delayed position relative to the V sync position of incoming signal.

3-5-5. Crosshatch Generator

Internal crosshatch signal is made as follows.

The vertical lines are generated by approx. 18fH rate pulses synchronized with flyback pulse.

And flyback pulse is counted down to generate horizontal lines.

3-5-6. Burst Gate Pulse, Y-CLAMP Pulse, C-CLAMP Pulse Generator

The Burst Gate Pulse (B.G.P.), clamp pulse for luminance signal (Y.CL.P) and clamp pulse for color difference signal (C.CL.P) are generated from 1H sync via LCR network and transistors.

3-5-7. Picture Set Up Pulse Generator

This is the gate pulse generator for picture set-up function, and consists of mono multipliers.

3-5-8. Split, Y Blanking, C Blanking Pulse Generator

Y BLANKING pulse (Y BLK P) and C BLANKING pulse (C BLK P) are generated. These pulses are used for the purpose of DC restoration of color difference signal, Y signal and RGB signal. DC restoration is made by inserting the black reference signal during blanking period in the signal. Also C.BLK. pulse is mixed with vertical rate blanking signals for SPLIT display and for B/W display.

3-5-9. Horizontal Rate AGC and Clamp Pulse Generator

COLOR GAIN control, CONTRAST control and BRIGHTNESS control are stabilized by insertion of reference signal and using feedback circuit. Horizontal rate BLACK pulse (B.P), BLACK CLAMP pulse (B.CL.P) and WHITE CLAMP pulse (W. CL.P) are generated here.

3-5-10. Vertical Rate AGC and Clamp Pulse Generator

In this model, BEAM CONTROL circuit is used for high stability in white balance.

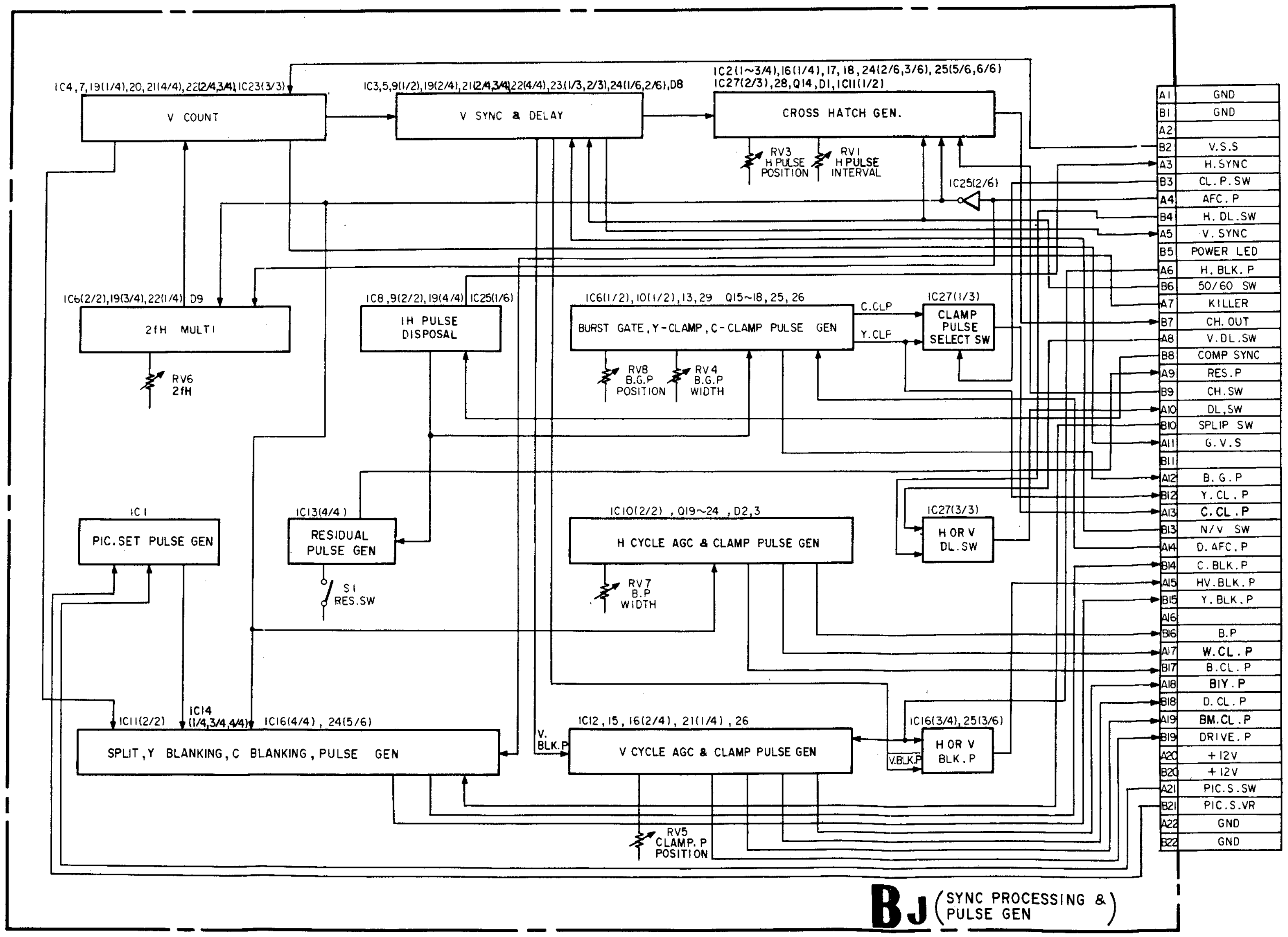
The reference signal is inserted in the signal for gain control circuit in video output amplifier and for beam control circuit. Vertical rate pulses are used for this purpose.

Vertical rate BEAM PULSE (BM.P) DRIVE PULSE (DRIVE.P) and BEAM CLAMP PULSE (BM.CL.P) are generated here.

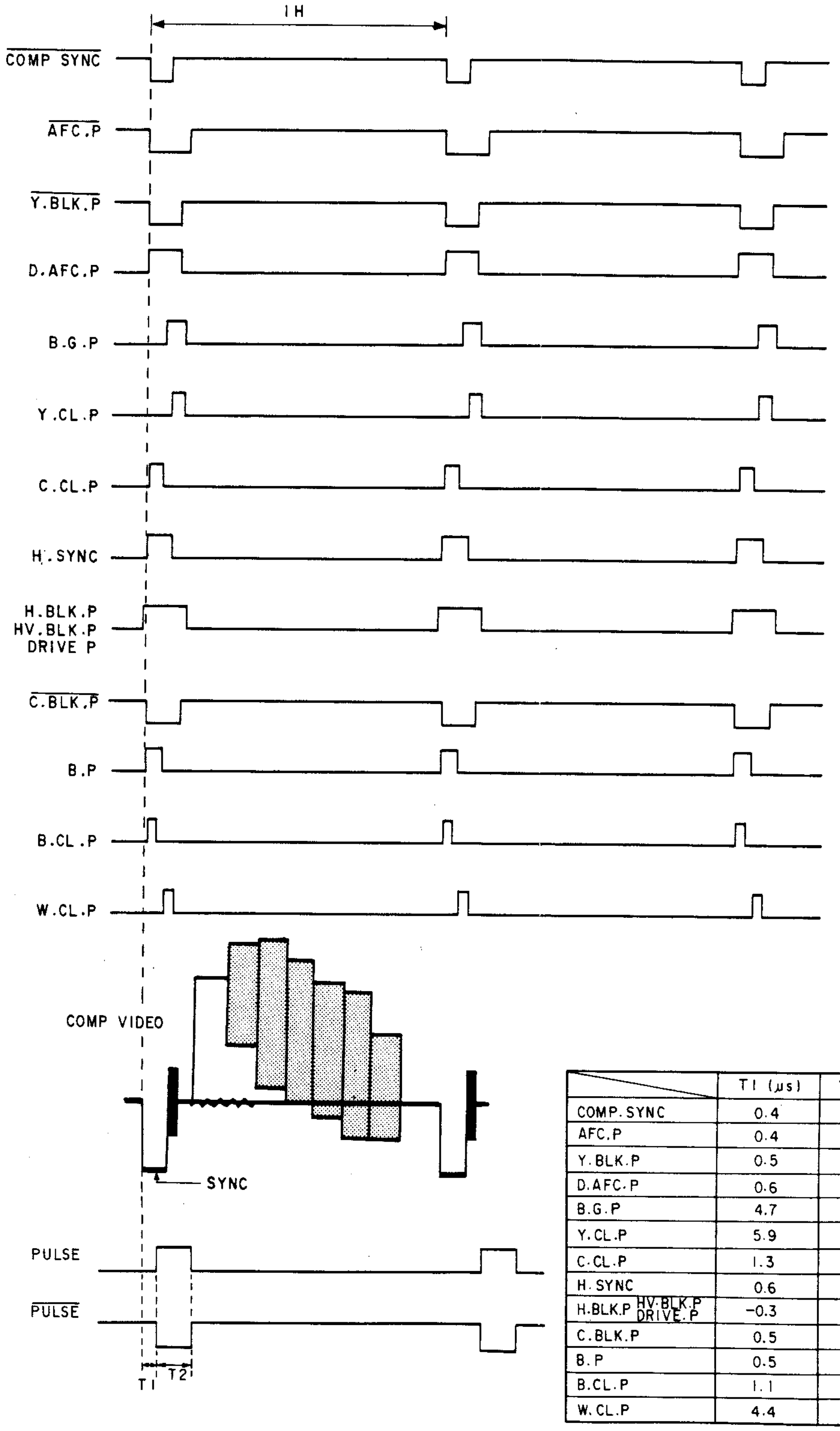
3-5-11. Others

Black reference is determined at the position of clamping in black reference insertion circuit for both color difference signal and RGB signal. Accordingly C.CL.P is used as clamp pulse for color difference signal processing and Y.CL.P is for RGB signal. CLAMP PULSE SELECTION SW switches C.CL.P. or Y CL.P to the clamp pulse for the insertion of black reference.

BLOCK DIAGRAM OF BJ BOARD


IC4,7,19(1/4),20,21(4/4),22(2/4,3/4),IC23(3/3)
V COUNT
IC3,5,9(1/2),19(2/4),21(2/4,3/4),22(4/4),23(1/3,2/3),24(1/6,2/6),D8
V SYNC & DELAY
IC2(1~3/4),16(1/4),17,18,24(2/6,3/6),25(5/6,6/6)
IC27(2/3),28,Q14,D1,IC11(1/2)
CROSS HATCH GEN.
RV3 H PULSE POSITION
RV1 H PULSE INTERVAL
IC25(2/6)
IC6(2/2),19(3/4),22(1/4) D9
2fH MULTI
RV6 2fH
IC8,9(2/2),19(4/4) IC25(1/6)
1H PULSE DISPOSAL
IC6(1/2),10(1/2),13,29 Q15~18,25,26
BURST GATE, Y-CLAMP, C-CLAMP PULSE GEN
RV8 B.G.P POSITION
RV4 B.G.P WIDTH
C.CLP
Y.CLP
IC27(1/3)
CLAMP PULSE SELECT SW
IC1
PIC.SET PULSE GEN
IC13(4/4)
RESIDUAL PULSE GEN
S1 RES.SW
IC10(2/2), Q19~24, D2,3
H CYCLE AGC & CLAMP PULSE GEN
RV7 B.P WIDTH
IC27(3/3)
H OR V DL.SW
IC11(2/2)
IC14 (1/4,3/4,4/4)
IC16(4/4), 24(5/6)
SPLIT, Y BLANKING, C BLANKING, PULSE GEN
V. BLK.P
IC12,15,16(2/4),21(1/4),26
V CYCLE AGC & CLAMP PULSE GEN
IC16(3/4),25(3/6)
V.BLK.P
H OR V BLK.P
RV5 CLAMP.P POSITION
A1 GND
B1 GND
A2
B2 V.S.S
A3 H.SYNC
B3 CL.P.SW
A4 AFC.P
B4 H.DL.SW
A5 V.SYNC
B5 POWER LED
A6 H.BLK.P
B6 50/60 SW
A7 KILLER
B7 CH.OUT
A8 V.DL.SW
B8 COMP SYNC
A9 RES.P
B9 CH.SW
A10 DL,SW
B10 SPLIP SW
A11 G.V.S
B11
A12 B.G.P
B12 Y.CL.P
A13 C.CL.P
B13 N/V SW
A14 D.AFC.P
B14 C.BLK.P
A15 HV.BLK.P
B15 Y.BLK.P
A16
B16 B.P
A17 W.CL.P
B17 B.CL.P
A18 BIY.P
B18 D.CL.P
A19 BM.CL.P
B19 DRIVE.P
A20 +12V
B20 +12V
A21 PIC.S.SW
B21 PIC.S.VR
A22 GND
B22 GND
BJ (SYNC PROCESSING & PULSE GEN)

TIMING CHART OF MAJOR PULSE (BJ BOARD)


1H
COMP SYNC
AFC.P
Y.BLK.P
D.AFC.P
B.G.P
Y.CL.P
C.CL.P
H.SYNC
H.BLK.P
HV.BLK.P
DRIVE P
C.BLK.P
B.P
B.CL.P
W.CL.P
COMP VIDEO
SYNC
PULSE
PULSE
T1
T2

	T1 (μs)	T2 (μs)
COMP.SYNC	0.4	4.8
AFC.P	0.4	9.0
Y.BLK.P	0.5	7.2
D.AFC.P	0.6	7.2
B.G.P	4.7	4.1
Y.CL.P	5.9	2.6
C.CL.P	1.3	3.0
H.SYNC	0.6	5.5
H.BLK.P HV.BLK.P DRIVE.P	−0.3	9.0
C.BLK.P	0.5	7.2
B.P	0.5	3.5
B.CL.P	1.1	1.8
W.CL.P	4.4	1.8

Figure 7

FIELD 1 VERTICAL BLANKING

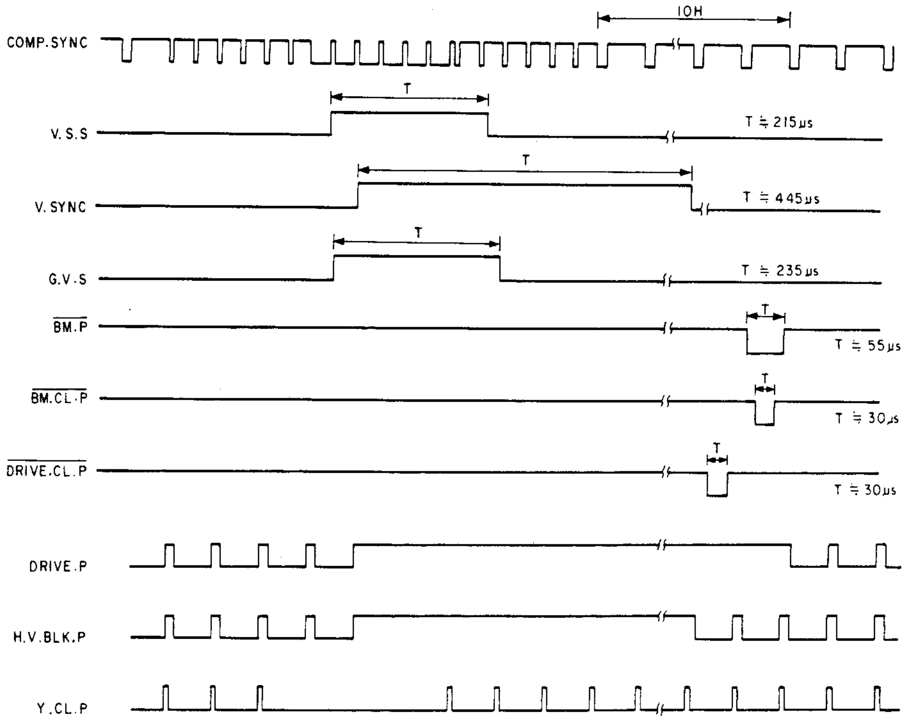

10H
COMP.SYNC
T
V.S.S
T ≒ 215μs
T
V.SYNC
T ≒ 445μs
T
G.V.S
T ≒ 235μs
BM.P
T
T ≒ 55μs
BM.CL.P
T
T ≒ 30μs
DRIVE.CL.P
T
T ≒ 30μs
DRIVE.P
H.V.BLK.P
Y.CL.P

Figure 8

FIELD 2 VERTICAL BLANKING

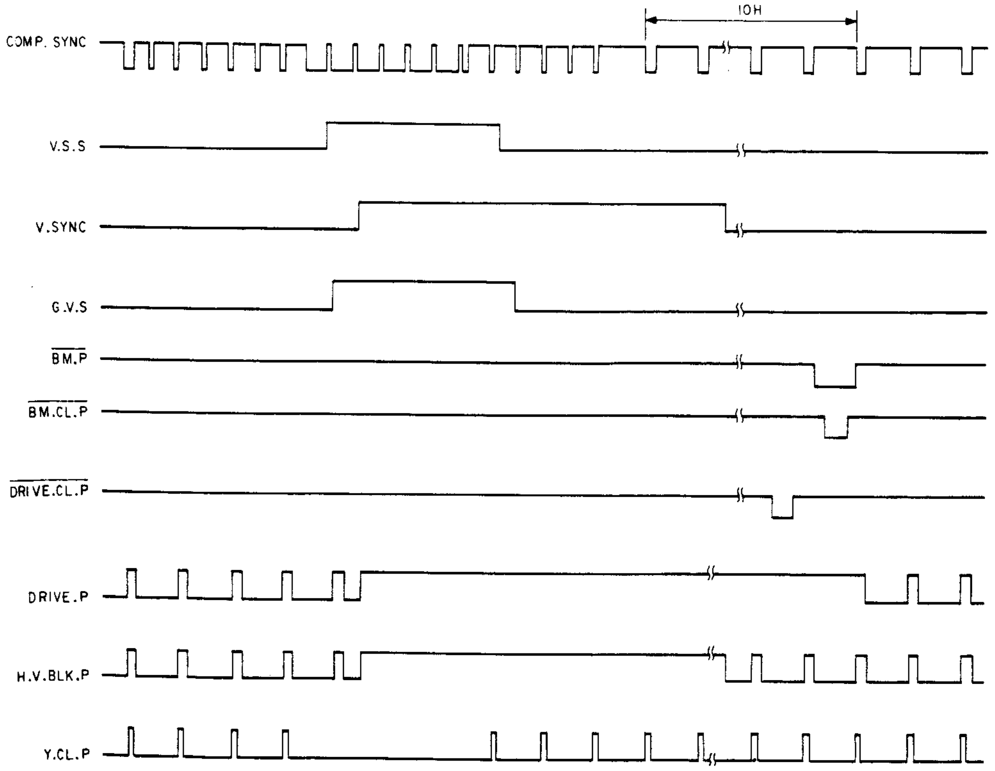

10H
COMP.SYNC
V.S.S
V.SYNC
G.V.S
BM.P
BM.CL.P
DRIVE.CL.P
DRIVE.P
H.V.BLK.P
Y.CL.P

Figure 9

3-6. BK BOARD

Following are described about Red channal. Green and Blue channel are the SAME.

3-6-1. Red Drive Amplifier, Red Buffer

This circuit drives final stage of video output amplifier. Gain is approx. 2

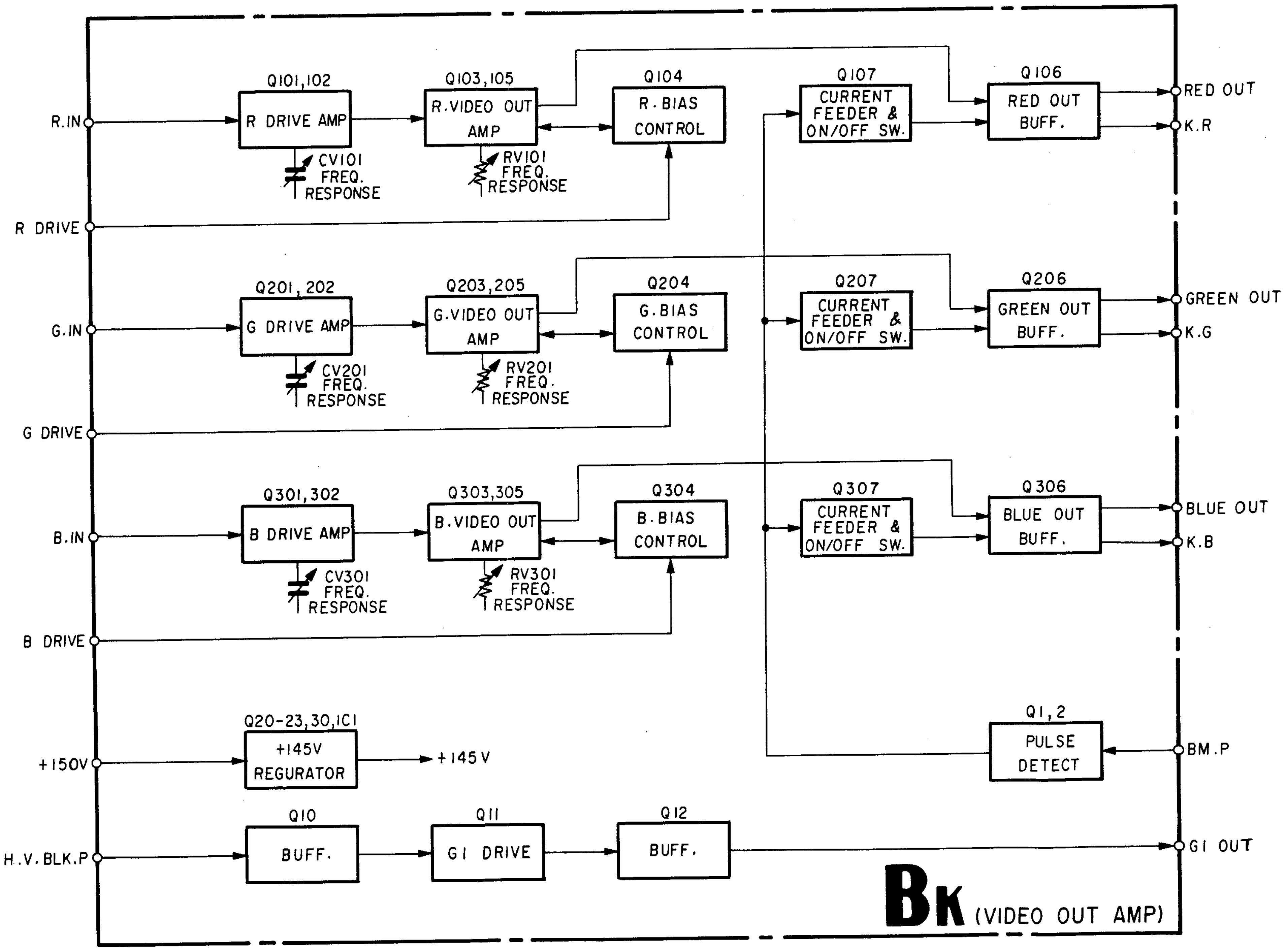
3-6-2. Red Video Output Amplifier and Buffer

This is the final stage amplifier to obtain amplitude enough to drive cathode of CRT.
Gain is approx. 11
The amplified signal is input to the RED cathode of CRT through the next stage's buffer. At this final stage's bufffer, the current source (Q107) is applied.
A BM.P signal of positive polarity is input to the base of Q107. For this BM.P period, Q107 is cut off, and the current is consequently not supplied to the buffer. So, the only current supplied from cathode is flown from emitter to collector of Q106 in this period.
This board outputs the Q106 collector current as K.R.

3-6-3. H.V. Blanking Circuit

H.V.BLK. pulse is amplified by G1 drive circuit and it is fed to the G1 of CRT through the buffer.

BLOCK DIAGRAM OF BK BOARD


R.IN
Q101,102
R DRIVE AMP
CV101 FREQ. RESPONSE
Q103,105
R.VIDEO OUT AMP
RV101 FREQ. RESPONSE
Q104
R.BIAS CONTROL
Q107
CURRENT FEEDER & ON/OFF SW.
Q106
RED OUT BUFF.
RED OUT
K.R
R DRIVE
G.IN
Q201, 202
G DRIVE AMP
CV201 FREQ. RESPONSE
Q203,205
G.VIDEO OUT AMP
RV201 FREQ. RESPONSE
Q204
G.BIAS CONTROL
Q207
CURRENT FEEDER & ON/OFF SW.
Q206
GREEN OUT BUFF.
GREEN OUT
K.G
G DRIVE
B.IN
Q301,302
B DRIVE AMP
CV301 FREQ. RESPONSE
Q303,305
B.VIDEO OUT AMP
RV301 FREQ. RESPONSE
Q304
B.BIAS CONTROL
Q307
CURRENT FEEDER & ON/OFF SW.
Q306
BLUE OUT BUFF.
BLUE OUT
K.B
B DRIVE
+150V
Q20-23,30,IC1
+145V REGURATOR
+145V
Q1,2
PULSE DETECT
BM.P
H.V.BLK.P
Q10
BUFF.
Q11
G1 DRIVE
Q12
BUFF.
G1 OUT
BK (VIDEO OUT AMP)

3-7. Beam control Circuit (BI, BK BOARD) (Same as Green and Blue)

Block diagram is shown in Figure 10.

3-7-1. Detection of Cathode Current and I-V Conversion (BI BOARD)

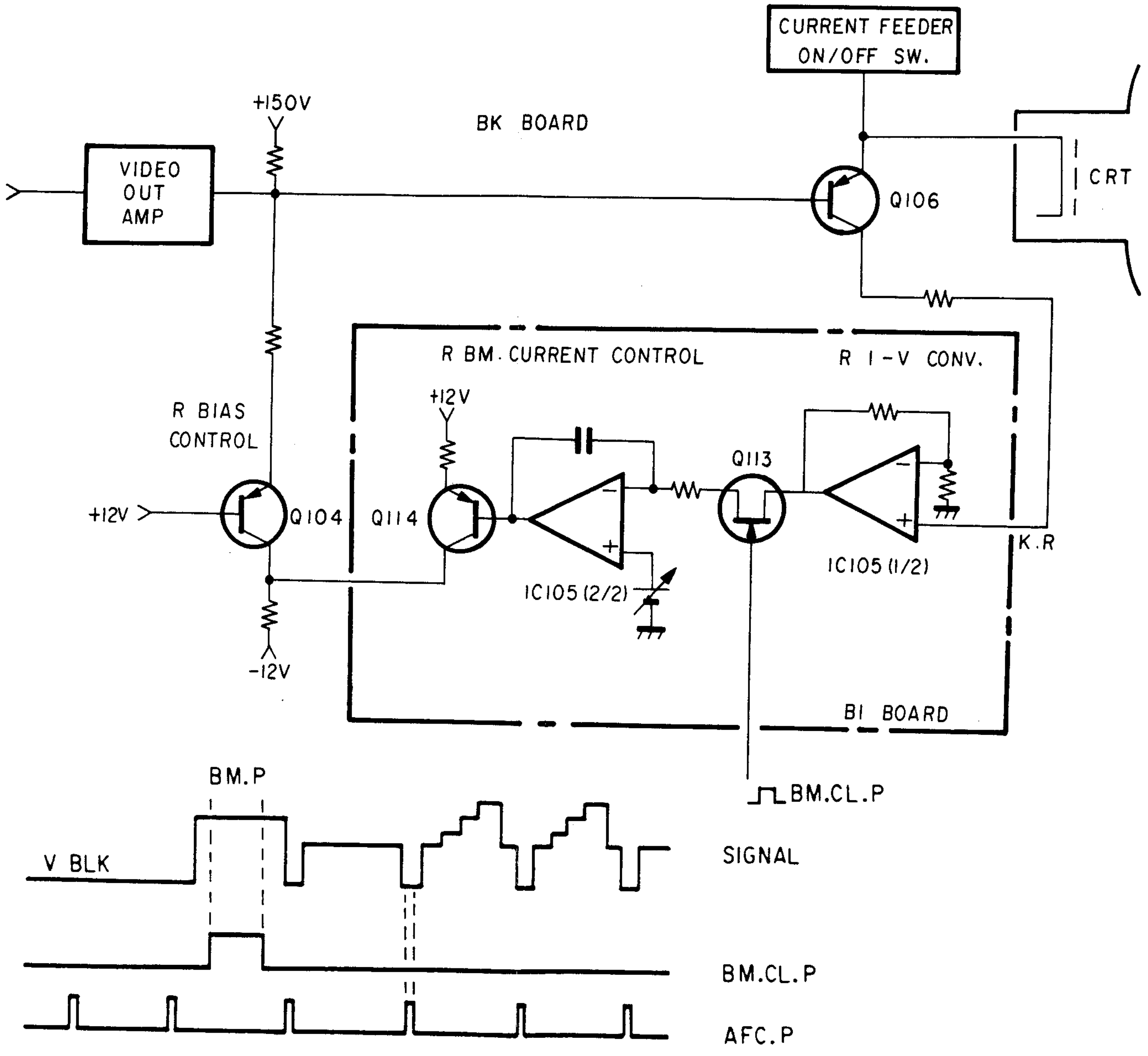
Cathode current is detected as a voltage by using IC105 (1/2)

3-7-2. Red BM. CURRENT Control (BI BOARD)

BMP is inserted in the signal during vertical blanking in BI board. This BMP is detected as a cathode current and sampled by BM CLP applied to FET Q113.
This BM. CURRENT control circuit controls the base voltage of transistor Q114 so that converted voltage from cathode current and the reference voltage may match.

3-7-3. Red Bias Control Circuit (BK BOARD)

In the R BIAS control circuit on the BK board, emitter current of Q104 is controlled according to the variation of Q114 base voltage on the BI board.
Therefore, the base voltage of Q106 changes so that the black level of signal that is input to the cathode of CRT is controlled.


CURRENT FEEDER ON/OFF SW.
+150V
BK BOARD
VIDEO OUT AMP
Q106
CRT
R BM. CURRENT CONTROL
R I-V CONV.
+12V
R BIAS CONTROL
Q113
+12V
Q104
Q114
IC105 (2/2)
IC105 (1/2)
K.R
-12V
BI BOARD
BM.CL.P
BM.P
V BLK
SIGNAL
BM.CL.P
AFC.P

3-8. NTSC COMB FILTER (BT BOARD) (BVM-1915 ONLY)

3-8-1. 3 Line Dynamic Comb Filter (Fig. 10)

The fed video signal is band limited by a low-pass filter. (This signal is hereinafter referred to as the 0H signal.) The 0H signal becomes the signal which is 1H (63.556 μsec) delayed by the 1H delay circuit (1H delayed signal) and the signal which is 1H further delayed by the 1H delay circuit (2H delayed signal).

The 0H, 1H, and 2H signals are band limited by the respective band-pass filters (center frequency: fs) for delay of $\lambda/2$(140 nsec). The 1H signal is further $\lambda/2$ delayed. The 0H+$\lambda/2$, 1H, 1H+$\lambda/2$, 1H+λ and 2H+$\lambda/2$ (Ⓐ, Ⓑ, Ⓒ, Ⓓ and Ⓔ of the block diagram) at each point are separated into chroma signals only by the correlation circuit (IC501).

The luminance signal is separated with the chroma signal subtracted from the 1H signal.

3-8-2. 2 Line Symple Comb Filter

The chroma signal is separated with the 0H+$\lambda/2$ and 1H+$\lambda/2$ signal subtracted, and the luminance signal is separated by subtracting the chroma signal from the 0H signal.

3-8-3. 1H Delay Circuit (Fig. 11)

The 1H delay circuit consists of two CCD delay lines.

These CCD delay lines are used in parallel to attain 1H (63.556 μsec) signal delay.

3-8-4. Band-pass Filter (Fig. 12)

The band-pass filter consists of a delay line. It performs band limiting with the group delay kept constant.

3-8-5. Correlation Circuit (IC501) (Fig. 13)

The correlation circuit consists of a limiter circuit which is common to emitters to perform separation of a chroma signal.

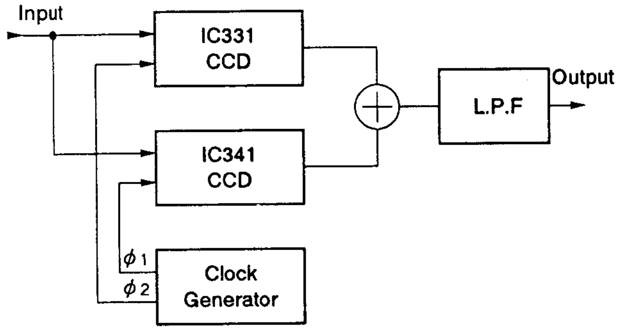

Input
IC331
CCD
IC341
CCD
Clock
Generator
ϕ1
ϕ2
L.P.F
Output

Figure 11

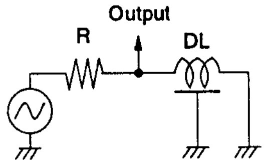


Figure 12

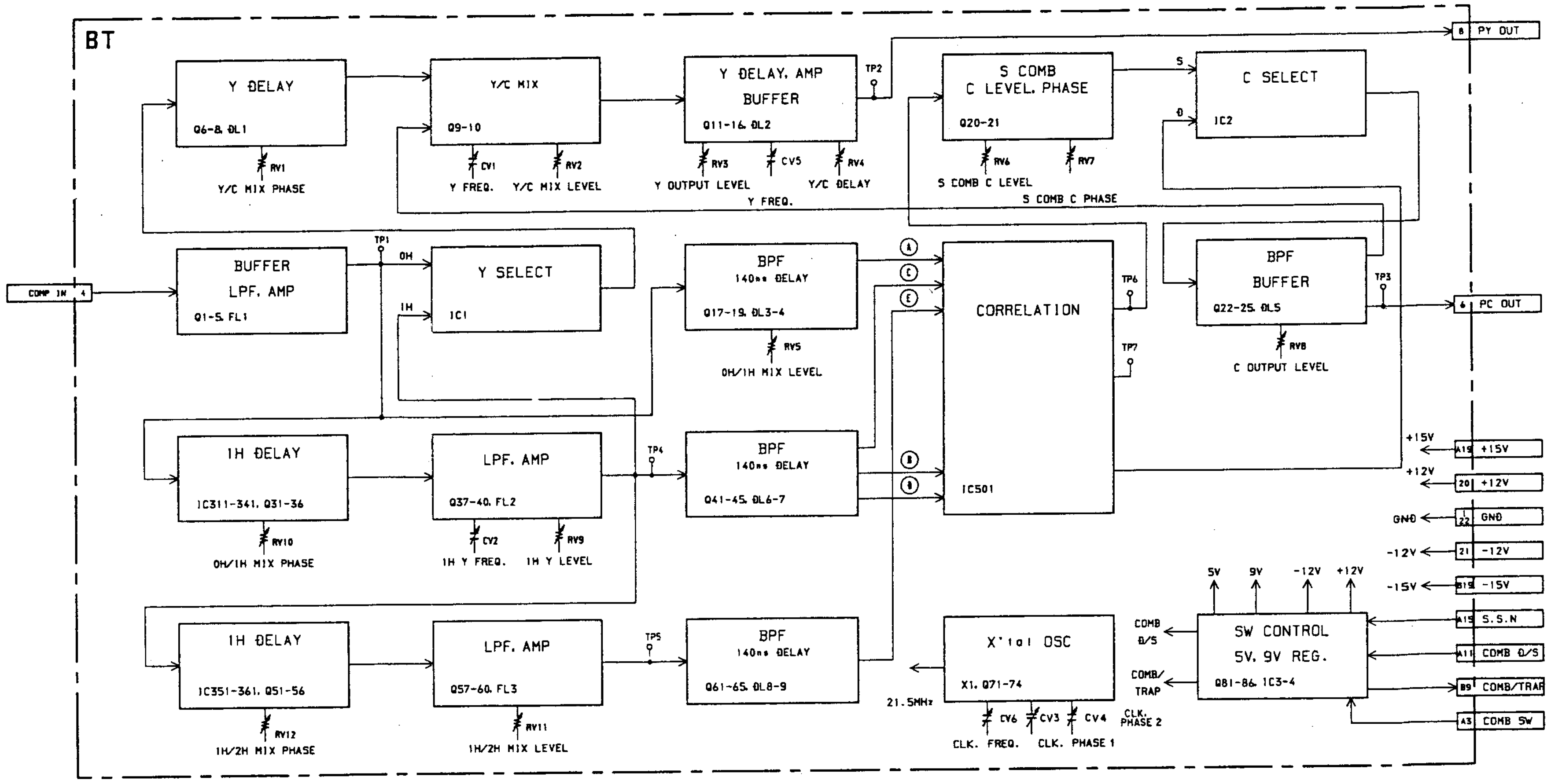

BT
COMP IN 4
BUFFER
LPF, AMP
Q1-5, FL1
TP1
0H
1H
Y SELECT
IC1
Y DELAY
Q6-8, DL1
RV1
Y/C MIX PHASE
Y/C MIX
Q9-10
CV1
RV2
Y FREQ.
Y/C MIX LEVEL
Y DELAY, AMP
BUFFER
Q11-16, DL2
TP2
RV3
CV5
RV4
Y OUTPUT LEVEL
Y/C DELAY
Y FREQ.
S COMB
C LEVEL, PHASE
Q20-21
RV6
RV7
S COMB C LEVEL
S COMB C PHASE
S
D
C SELECT
IC2
8 PY OUT
BPF
140ns DELAY
Q17-19, DL3-4
RV5
0H/1H MIX LEVEL
Ⓐ
Ⓒ
Ⓔ
Ⓑ
Ⓓ
CORRELATION
IC501
TP6
TP7
BPF
BUFFER
Q22-25, DL5
TP3
RV8
C OUTPUT LEVEL
6 PC OUT
1H DELAY
IC311-341, Q31-36
RV10
0H/1H MIX PHASE
LPF, AMP
Q37-40, FL2
CV2
RV9
1H Y FREQ.
1H Y LEVEL
TP4
BPF
140ns DELAY
Q41-45, DL6-7
1H DELAY
IC351-361, Q51-56
RV12
1H/2H MIX PHASE
LPF, AMP
Q57-60, FL3
RV11
1H/2H MIX LEVEL
TP5
BPF
140ns DELAY
Q61-65, DL8-9
21.5MHz
X'tal OSC
X1, Q71-74
CV6
CV3
CV4
CLK. FREQ.
CLK. PHASE 1
CLK. PHASE 2
COMB D/S
COMB/TRAP
SW CONTROL
5V, 9V REG.
Q81-86, IC3-4
5V
9V
-12V
+12V
+15V
A19 +15V
+12V
20 +12V
GND
1 22 GND
-12V
21 -12V
-15V
B19 -15V
A15 S.S.N
A11 COMB D/S
B9 COMB/TRAP
A3 COMB SW

Figure 10

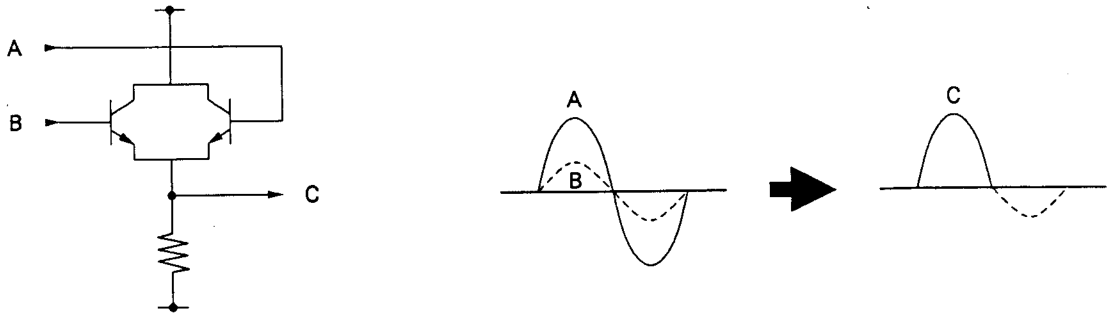


Figure 13

(BVM-1915 ONLY)

3-9. NTSC DEMODULATOR, Y TRAP CIRCUIT (BC BOARD)

The composite video signal (NTSC) supplied from BA board is fed to transistor Q1 (buffer), then is supplied to the 3.58MHz trap circuit with Y signal and to band pass filter with chrominance signal.

3-9-1. Chroma Band Pass Filter

The composite video signal obtained from at the emitter of transistor Q1 is fed to the Band pass filter composed of resistor R18, capacitor C7, C8, inductor L3 and transistor Q5.
The center frequency of this filter is adjusted to the subcarrier frequency (3.58MHz) by L3, and chrominance signal is derived from Q5.

This circuit selects comb filter (BB board) mode or notch filter mode by a push of button on the front panel. When comb filter mode is selected, comb switch circuit composed of transistor Q103 and Q104 activates and base voltage of Q5 goes down to −12V and Q15 is cut off and then chrominance signal (Pure C) is provided from comb filter circuit to IC2.

3-9-2. Residual SW Circuit

The chrominance signal dervied at transistor Q5 is fed to analog switcher IC2.
When switch S1 on BJ board is set to ON position, residual pulse which has almost same phase as H sync is fed to control terminal of analog switcher (pin ③ of IC2) and screening is performed during H sync period.
When switch S1 on BJ board is set to OFF position, Low level signal (0V DC) is fed to control terminal and screening action is not performed. Thus residual switch circuit does not activate.
When there is residual subcarrier in the video signal, clamp level of color difference signal changes by turning switch S1 ON/OFF and therefore residual subcarrier can be checked on the picture as a color shift.

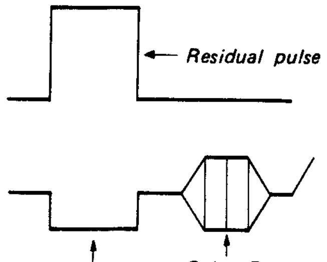

Residual pulse
H Sync
Color Burst

Figure 14

3-9-3. Chroma Amplifier Circuit

The level of chrominance signal from residual switch circuit (IC2 pin ④) is divided by resistor R85 and R86 and is fed to chroma amplifier circuit (Q6, Q7, Q8).
The gain of this amplifier is almost 1 and this amplifier has 2 outputs. They are non-inverted signal and inverted signal.
Non-inverted signal is fed to R-Y input terminal (IC1 pin ③) of demodulator and inverted signal to B-Y input terminal (IC1 pin②).

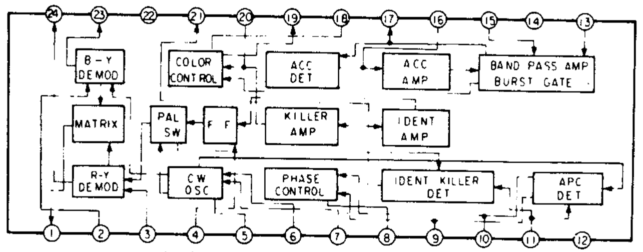
3-9-4. Phase Control Circuit

The chrominance signal from residual switch is also fed to phase control circuit (Q9, Q10, Q11, Q12, D12).
In this circuit, a variable capacitance diode (D2) is used to control the phase of color burst signal.
Anode voltage of D2 is applied by variable resistor RV2 and preset adjustment of phase is made by this variable resistor.

When the PHASE control on the right side of the front panel is turned, DC level of phase control signal (board terminal A13) changes and this phase control signal is fed to the cathode of D2 via analog switcher (IC3). In this way, Burst phase of chrominance signal is controlled according to the DC level of the phase control signal.
Analog switcher IC3 (2/3) activates to make short-circuit between input terminal pin ⑬ and output terminal pin ⑭ , only when COLOR STANDARD SELECTOR in the right side of drawer is selected to NTSC and otherwise pin ⑬ kept opn circuit.
As above phase controlled chrominance signal is derived from emitter of transistor Q12 and burst signal in this signal is gated by IC (1/3). The gated burst signal is fed to the burst input terminal pin ⑪ of demodulator IC1.

3-9-5. NTSC Demodulator

Block diagram of IC used for NTSC demodulator is shown in Figure 16.
This IC is designed for use of NTSC demodulator.
When chrominance signal is fed to pin ② and pin ③ , color burst signal to pin ⑪ and Burst Gate Pulse (B.G.P.) to pin ⑬ , R-Y and B-Y color difference signals are obtained at output terminals pin ㉓ and pin ㉔ .
The demodulation axes of this demodulator are R-Y axis and B-Y axis. Variable capacitor CV1 is adjusted so that the phase angles between them are 90°.
Local oscillator (3.58MHz) is formed by CW oscillator in IC1 connected to the terminal pin ⑤, ⑥, ⑦, ⑧ and external circuit. The variable capacitor CV2 is adjusted so that the free run frequency may be subcarrer frequency 3.579545MHz.
Also APC (Automatic Phase Control) circuit is formed by APC section in IC1 connected to the terminal pin ⑨ and ⑩ local oscillator is controlled by APC circuit.
The color difference signals demodulated by this IC are fed to low pass filter, where high frequency component is removed, then R-Y and B-Y color difference signals are obtained.


㉔
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㉑
⑳
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⑮
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⑬
B-Y DEMOD
COLOR CONTROL
ACC DET
ACC AMP
BAND PASS AMP BURST GATE
MATRIX
PAL SW
F F
KILLER AMP
IDENT AMP
R-Y DEMOD
CW OSC
PHASE CONTROL
IDENT KILLER DET
APC DET
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
⑫

Block diagram of NTSC demodulator

Figure 15

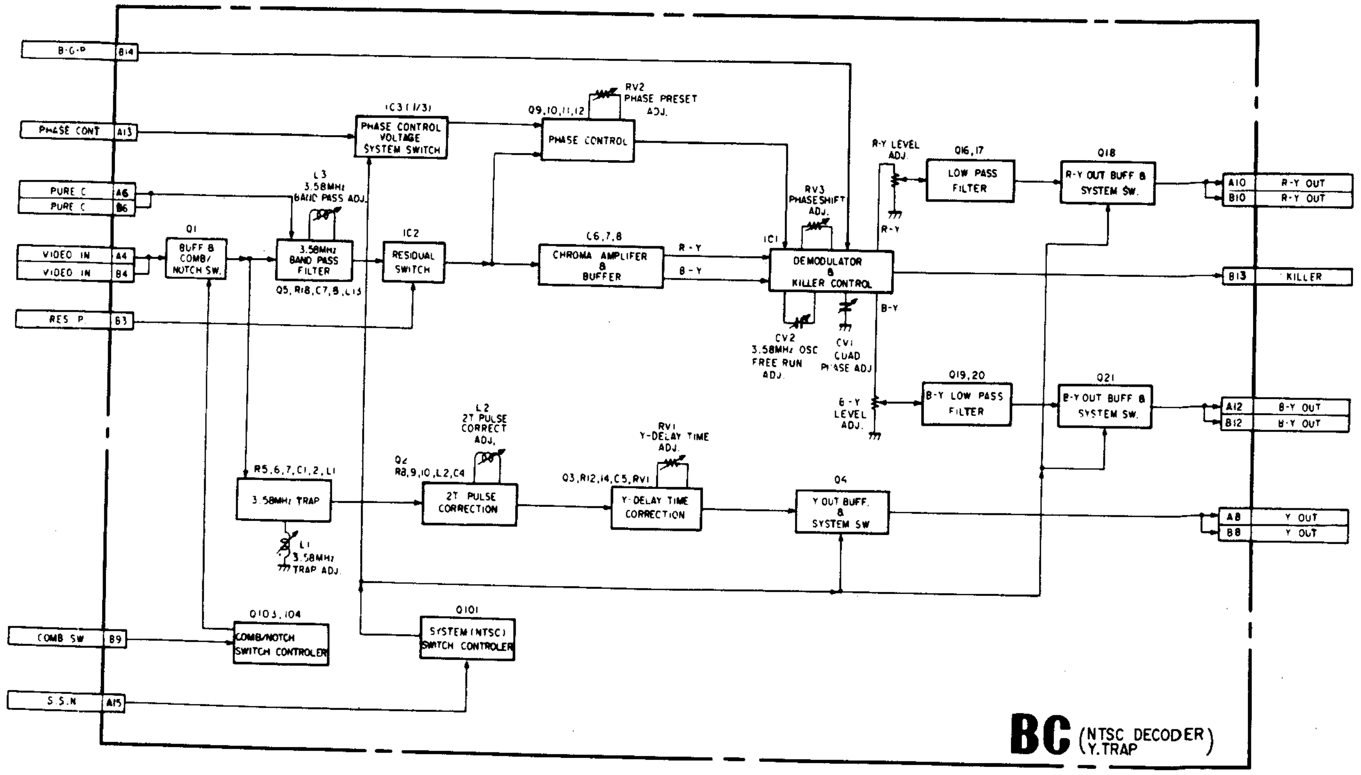
3-9-6. 3.58MHz Trap Circuit, Phase Compensation, Y Delay Correction Circuit

The composite video signal from emitter of transistor Q1 is fed to 3.58MHz trap circuit composed of resistor R5, R6, R7, capacitor C1 and inductor L1.
Adjustment of L1 is made so that the resonance frequency of this trap circuit should be subcarrier frequency.
Y (Luminance) signal removed subcarrier is obtained at output terminal of the trap circuit and is fed to the phase compensation circuit. (Transistor Q2, resistor R8, R9 R10, inductor L2 capacitor C4)
This circuit compensates phase delay of the signal at high frequency due to the trap circuit.
Y signal compensated phase delay is fed to Y-delay circuit. In this circuit Luminance/Chrominance time error is compensated by delay line.

3-9-7. Color Standard Selector

When NTSC system is not selected by the COLOR STANDARD SELECTOR in the right side drawer, transistor Q101 is cut off and +12V line power source is not supplied to the demodulator circuit.

BLOCK DIAGRAM OF BC BOARD


B·G·P
B14
PHASE CONT
A13
PURE C
A6
PURE C
B6
VIDEO IN
A4
VIDEO IN
B4
RES P.
B3
COMB SW
B9
S.S.N
A15
IC3 (1/3)
PHASE CONTROL VOLTAGE SYSTEM SWITCH
Q9,10,11,12
RV2
PHASE PRESET ADJ.
PHASE CONTROL
L3
3.58MHz BAND PASS ADJ.
Q1
BUFF & COMB/ NOTCH SW.
3.58MHz BAND PASS FILTER
Q5, R18, C7, 8, L13
IC2
RESIDUAL SWITCH
C6,7,8
CHROMA AMPLIFER & BUFFER
R-Y
B-Y
RV3
PHASESHIFT ADJ.
IC1
DEMODULATOR & KILLER CONTROL
CV2
3.58MHz OSC FREE RUN ADJ.
CV1
QUAD PHASE ADJ
R-Y LEVEL ADJ.
Q16,17
LOW PASS FILTER
Q18
R-Y OUT BUFF & SYSTEM SW.
A10
R-Y OUT
B10
R-Y OUT
B13
KILLER
B-Y LEVEL ADJ.
Q19,20
B-Y LOW PASS FILTER
Q21
B-Y OUT BUFF & SYSTEM SW.
A12
B-Y OUT
B12
B-Y OUT
R5,6,7,C1,2,L1
3.58MHz TRAP
L1
3.58MHz TRAP ADJ.
L2
2T PULSE CORRECT ADJ.
Q2
R8,9,10,L2,C4
2T PULSE CORRECTION
RV1
Y-DELAY TIME ADJ.
Q3,R12,14,C5,RV1
Y-DELAY TIME CORRECTION
Q4
Y OUT BUFF. & SYSTEM SW
A8
Y OUT
B8
Y OUT
Q103,104
COMB/NOTCH SWITCH CONTROLER
Q101
SYSTEM (NTSC) SWITCH CONTROLER
BC (NTSC DECODER Y.TRAP)

(BVM-2015P ONLY)

3-10. PAL DEMODULATOR, Y TRAP CIRCUIT (BD BOARD)

The composite video signal (PAL) supplied from BA board is fed to transistor Q1 (buffer), then is supplied to the 4.43 MHz trap circuit with Y signal and to band pass filter with chrominance signal.

3-10-1. Chroma Band Pass Filter

The composite video signal obtained from at the emitter of transistor Q1 is fed to the Band pass filter composed of resistor R12, capacitor C7, C8, inductor L3 and transistor Q5.

The center frequency of this filter is adjusted to the subcarrier frequency (4.43 MHz) by L3, and chrominance signal is derivied from Q5.

3-10-2. Residual SW Circuit

The chrominance signal derivied at transistor Q5 is fed to analog switcher IC2.

When switch S1 on BJ board is set to ON position, residual pulse which has almost same phase as H sync is fed to control terminal of analog switcher (pin ③ of IC2) and screening is performed during H sync period.

When switch S1 on BJ board is set to OFF position, Low level signal (0V DC) is fed to control terminal and screening action is not performed. Thus residual switch circuit does not activate.

When there is residual subcarrier in the video signal, clamp level of color difference signal changes by turning switch S1 ON/OFF and therefore residual subcarrier can be checked on the picture as a color shift.

3-10-3. Chroma Amplifier Circuit

The chrominance signal from residual switch circuit (IC2 pin④) is fed to chroma amplifier circuit (Q19, Q36).

After the chroma signal is amplified by the inversion amplifier (gain: 1X), it is voltage divided by resistors R400 and R314 and then input to the R-Y input terminal (IC1, pin (3)) and B-Y input terminal (IC1, pin (2)) of the following demodulator circuit via the buffer (Q38).

3-10-4. Phase Control Circuit

The chrominance signal from residual switch is also fed to phase control circuit (Q6, Q7, Q8, Q9, D12).

In this circuit, a variable capacitance diode (D10) is used to control the phase of color burst signal.

Anode voltage of D10 is applied by variable resistor RV8 and preset adjustment of phase is made by this variable resistor.

When the PHASE control on the right side of the front panel is turned, DC level of phase control signal (board terminal A13) changes and this phase control signal is fed to the cathode of D10 via analog switcher (IC5). In this way, Burst phase of chrominance signal is controlled according to the DC level of the phase control signal.

When PAL-D is selected with the PAL switch inside the right side drawer, between pins ③ and ④ of IC5 becomes conductive and phase control becomes dependent on RV7, disabling the Phase Control of the right side front panel.

Analog switcher IC5 (1/3) activates to make short-circuit between input terminal pin ③ or ⑤ and output terminal pin④, only when COLOR STANDARD SELECTOR in the right side of drawer is selected to PAL and otherwise pin ⑤ kept open circuit.

As above phase controlled chrominance signal is derived from collector of transistor Q9 and burst signal in this signal is gated by IC6. The gated burst signal is fed to the burst input terminal pin ⑪ of demodulator IC1.

3-10-5. PAL Demodulator

Block diagram of IC used for PAL demodulator is shown in Figure 1. This IC is designed for use of NTSC demodulator.

When chrominance signal is fed to pin ② and pin ③, color burst signal to pin ⑪ and Burst Gate Pulse (B.G.P.) to pin ⑬ . R-Y and B-Y color difference signals are obtained at output terminals pin ㉓ and pin ㉔

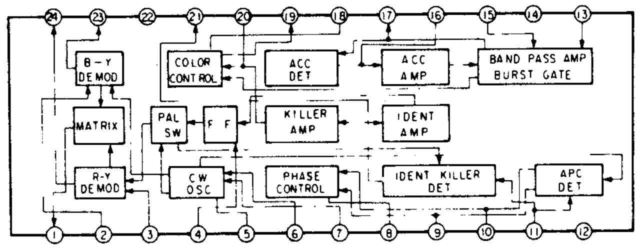
The demodulation axes of this demodulator are R-Y axis and B-Y axis. Variable capacitor CV1 is adjusted so that the phase angles between them are 90°.

Local oscillator (4.43 MHz) is formed by CW oscillator in IC1 connected to the terminal pin⑤, ⑥, ⑦, ⑧ and external circuit.

The variable capacitor CV2 is adjusted so that the free run frequency may be subcarrer frequency 4.433619 MHz.

Also APC (Automatic Phase Control) circuit is formed by APC section in IC1 connected to the terminal pins ⑨ and ⑩ local oscillator is controlled by APC circuit.

The color difference signals demodulated by this IC are fed to low pass filter, where high frequency component is removed, then R-Y and B-Y color difference signals are obtained.


㉔
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⑮
⑭
⑬
B – Y DEMOD
COLOR CONTROL
ACC DET
ACC AMP
BAND PASS AMP BURST GATE
MATRIX
PAL SW
F F
KILLER AMP
IDENT AMP
R-Y DEMOD
CW OSC
PHASE CONTROL
IDENT KILLER DET
APC DET
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
⑫

Block diagram of PAL demodulator

Figure 16

3-10-6. PAL-D Matrix and PAL S/D Switching Circuit

This circuit is further divided into circuits for the R-Y and B-Y signals, but the operation of both circuits is the same. So only the R-Y one will be explained.

R-Y signals input from the demodulator circuit are input to Q20 (BUFF) and Q21 (BUFF).

The signals input to Q21 are then input to pin ② of the analog switcher (IC5). When PAL S has been selected, between pins ② and ⑮ becomes conductive and the signals are supplied to the following circuit via Q33 (BUFF).

The signals input to Q20 are formed by IC7 and Q18.

Bias is controlled by a clamp circuit and is input to pin ⑮ of the 1H delay line (IC3). The DC level of the input is adjusted to the optimum value by using RV9.

IC3, driven by the 10.64 MHz clock signal generated by the clock generator circuit configured with XZ, Q34 and Q35, delays the input signal by 1H cycle and outputs it from pin ⑪ .

The high frequency component of the signal thus output is removed by the low-pass filter configured with Q22 and Q23, after which the signal is input to the following PAL-D matrix circuit.

The PAL-D matrix circuit is configured with R100, R101 and Q24. The signal that was not delayed is input through R100 while the 1H delayed signal is input through R101 at a ratio of 1/2.

The PAL-D signal added to the base of Q24 is obtained from its emitter. The signal obtained from the Q24 emitter is input to pin ① of IC5. When PAL-D is selected, between pins ① and ⑮ becomes conductive and the signal is supplied to the following circuit via Q33 (BUFF).

3-10-7. 4.43 MHz Trap Circuit, Phase Compensation, Y Delay Correction Circuit

The composite video signal from the emitter of transistor Q1 is fed to 4.43 MHz trap circuit composed of resistor R5, R6, R7, capacitor C1, C2 and inductor L1.

Adjustment of L1 is made so that the resonance frequency of this trap circuit should be subcarrier frequency.

Y (Luminance) signal removed subcarrier is obtained at output terminal of the trap circuit and is fed to the phase compensation circuit. (Transistor Q2, resistor R8, R9 R10, inductor L2 capacitor C4)

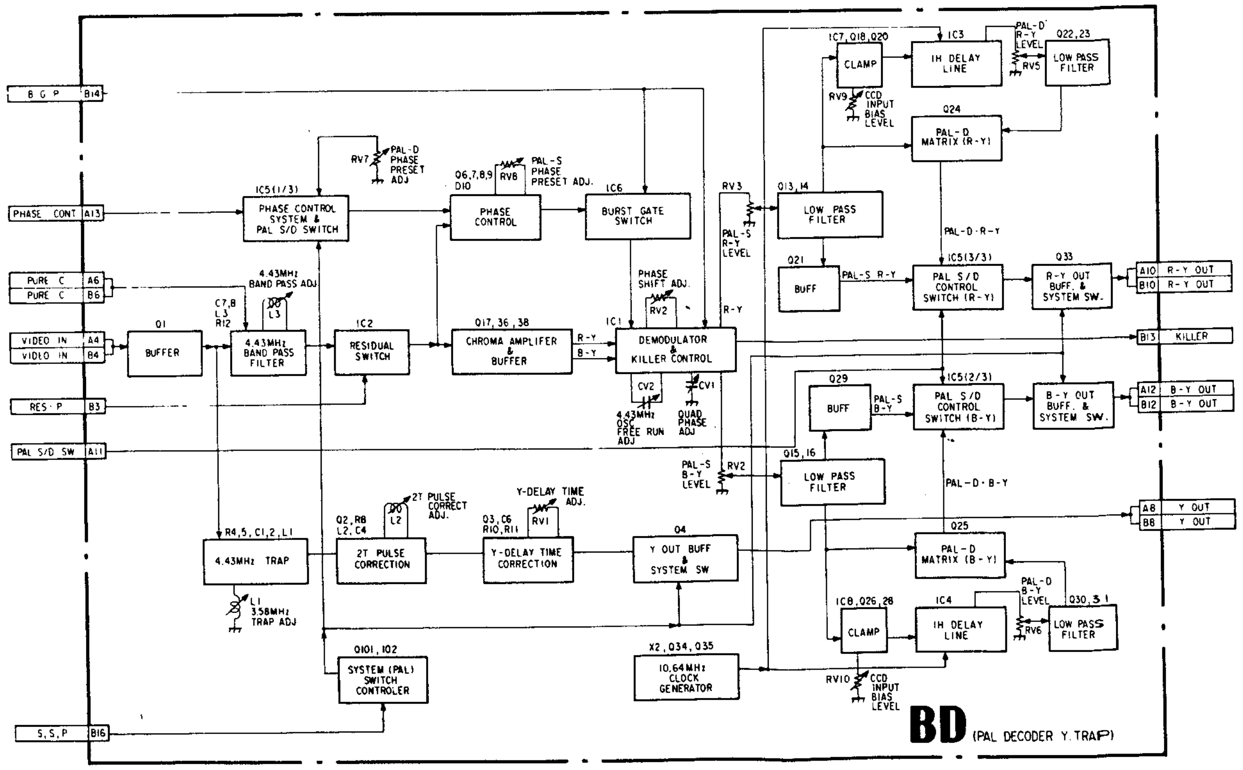
This circuit compensates phase delay of the signal at high frequency due to the trap circuit.

Y signal compensated phase delay is fed to Y-delay circuit. In this circuit Luminance/Chrominance time error is compensated by delay line.

3-10-8. Color Standard Selector

When PAL system is not selected by the COLOR STANDARD SELECTOR in the right side drawer, transistor Q101, Q102 are cut off and ±12V line power source is not supplied to the demodulator circuit.

BLOCK DIAGRAM OF BD (PAL) BOARD


B G P B14
PHASE CONT A13
PURE C A6
PURE C B6
VIDEO IN A4
VIDEO IN B4
RES P B3
PAL S/D SW A11
S, S, P B16
Q1
BUFFER
C7,8 L3 R12
4.43MHz BAND PASS ADJ
L3
4.43MHz BAND PASS FILTER
IC2
RESIDUAL SWITCH
IC5(1/3)
PHASE CONTROL SYSTEM & PAL S/D SWITCH
RV7 PAL-D PHASE PRESET ADJ
Q6,7,8,9 D10
RV8 PAL-S PHASE PRESET ADJ.
PHASE CONTROL
IC6
BURST GATE SWITCH
Q17, 36, 38
CHROMA AMPLIFER & BUFFER
R-Y
B-Y
IC1
PHASE SHIFT ADJ.
RV2
DEMODULATOR & KILLER CONTROL
CV2
CV1
4.43MHz OSC FREE RUN ADJ
QUAD PHASE ADJ
RV3
PAL-S R-Y LEVEL
PAL-S B-Y LEVEL
RV2
Q13, 14
LOW PASS FILTER
Q21
BUFF
PAL-S R-Y
IC7, Q18, Q20
CLAMP
RV9 CCD INPUT BIAS LEVEL
IC3
1H DELAY LINE
PAL-D R-Y LEVEL
RV5
Q22, 23
LOW PASS FILTER
Q24
PAL-D MATRIX (R-Y)
PAL-D-R-Y
IC5(3/3)
PAL S/D CONTROL SWITCH (R-Y)
Q33
R-Y OUT BUFF. & SYSTEM SW.
A10 R-Y OUT
B10 R-Y OUT
B13 KILLER
Q29
BUFF
PAL-S B-Y
IC5(2/3)
PAL S/D CONTROL SWITCH (B-Y)
B-Y OUT BUFF. & SYSTEM SW.
A12 B-Y OUT
B12 B-Y OUT
Q15, 16
LOW PASS FILTER
PAL-D-B-Y
A8 Y OUT
B8 Y OUT
Q25
PAL-D MATRIX (B-Y)
IC8, Q26, 28
CLAMP
RV10 CCD INPUT BIAS LEVEL
IC4
1H DELAY LINE
PAL-D B-Y LEVEL
RV6
Q30, 3 1
LOW PASS FILTER
R4, 5, C1, 2, L1
4.43MHz TRAP
L1 3.58MHz TRAP ADJ
Q2, R8 L2, C4
L2 2T PULSE CORRECT ADJ.
2T PULSE CORRECTION
Q3, C6 R10, R11
RV1 Y-DELAY TIME ADJ.
Y-DELAY TIME CORRECTION
Q4
Y OUT BUFF & SYSTEM SW
Q101, 102
SYSTEM (PAL) SWITCH CONTROLER
X2, Q34, Q35
10.64MHz CLOCK GENERATOR
BD (PAL DECODER Y TRAP)

(BVM-2015PM ONLY)

3-11.PAL-M DEMODULATOR, Y TRAP CIRCUIT (BM BOARD)

The composite video signal supplied from BA board is fed to transistor Q1 (buffer), then is supplied to the 3.58 MHz trap circuit with Y signal and to band pass filter with chrominance signal.

3-11-1. Chroma Band Pass Filter

The composite video signal obtained from at the emitter of transistor Q1 is fed to the Band pass filter composed of resistor R12, capacitor C7, C8, inductor L3 and transistor Q5.
The center frequency of this filter is adjusted to the subcarrier frequency (3.58 MHz) by L3, and chrominance signal is derivied from Q5.

3-11-2. Residual SW Circuit

The chrominance signal derivied at transistor Q5 is fed to analog switcher IC2.
When switch S1 on BJ board is set to ON position, residual pulse which has almost same phase as H sync is fed to control terminal of analog switcher (pin ③ of IC2) and screening is performed during H sync period.
When switch S1 on BJ board is set to OFF position, Low level signal (0V DC) is fed to control terminal and screening action is not performed. Thus residual switch circuit does not activate.
When there is residual subcarrier in the video signal, clamp level of color difference signal changes by turning switch S1 ON/OFF and therefore residual subcarrier can be checked on the picture as a color shift.

3-11-3. Chroma Amplifier Circuit

The chrominance signal from residual switch circuit (IC2 pin④) is fed to chroma amplifier circuit (Q19, Q36).
After the chroma signal is amplified by the inversion amplifier (gain: 1X), it is voltage divided by resistors R400 and R314 and then input to the R-Y input terminal (IC1, pin (3)) and B-Y input terminal (IC1, pin (2)) of the following demodulator circuit via the buffer (Q38).

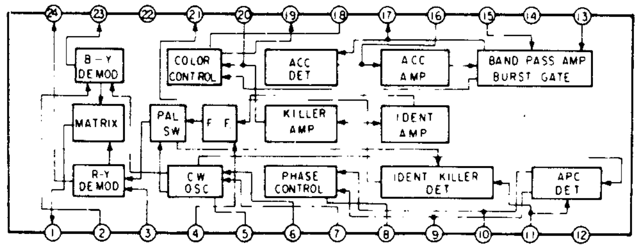
3-11-4. Phase Control Circuit

The chrominance signal from residual switch is also fed to phase control circuit (Q6, Q7, Q8, Q9, D12).
In this circuit, a variable capacitance diode (D10) is used to control the phase of color burst signal.
Anode voltage of D10 is applied by variable resistor RV8 and preset adjustment of phase is made by this variable resistor.
When the PHASE control on the right side of the front panel is turned, DC level of phase control signal (board terminal A13) changes and this phase control signal is fed to the cathode of D10 via analog switcher (IC5). In this way, Burst phase of chrominance signal is controlled according to the DC level of the phase control signal.
When PAL-D is selected with the PAL switch inside the right side drawer, between pins ③ and ④ of IC5 becomes conductive and phase control becomes dependent on RV7, disabling the Phase Control of the right side front panel.

Analog switcher IC5 (1/3) activates to make short-circuit between input terminal pin ③ or ⑤ and output terminal pin④, only when COLOR STANDARD SELECTOR in the right side of drawer is selected to PAL and otherwise pin ⑤ kept open circuit.
As above phase controlled chrominance signal is derived from collector of transistor Q9 and burst signal in this signal is gated by IC6. The gated burst signal is fed to the burst input terminal pin ⑪ of demodulator IC1.

3-11-5. PAL-M Demodulator

Block diagram of IC used for PAL demodulator is shown in Figure 1. This IC is designed for use of NTSC demodulator.
When chrominance signal is fed to pin ② and pin ③, color burst signal to pin ⑪ and Burst Gate Pulse (B.G.P.) to pin ⑬, R-Y and B-Y color difference signals are obtained at output terminals pin ㉓ and pin ㉔
The demodulation axes of this demodulator are R-Y axis and B-Y axis. Variable capacitor CV1 is adjusted so that the phase angles between them are 90°.
Local oscillator (3.58 MHz) is formed by CW oscillator in IC1 connected to the terminal pin⑤, ⑥, ⑦, ⑧ and external circuit.
The variable capacitor CV2 is adjusted so that the free run frequency may be subcarrer frequency 3.575611 MHz.
Also APC (Automatic Phase Control) circuit is formed by APC section in IC1 connected to the terminal pin ⑨ and ⑩ local oscillator is controlled by APC circuit.
The color difference signals demodulated by this IC are fed to low pass filter, where high frequency component is removed, then R-Y and B-Y color difference signals are obtained.


㉔
㉓
㉒
㉑
⑳
⑲
⑱
⑰
⑯
⑮
⑭
⑬
B-Y DEMOD
COLOR CONTROL
ACC DET
ACC AMP
BAND PASS AMP BURST GATE
MATRIX
PAL SW
F F
KILLER AMP
IDENT AMP
R-Y DEMOD
CW OSC
PHASE CONTROL
IDENT KILLER DET
APC DET
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
⑫

Block diagram of PAL-M demodulator

Figure 17

3-11-6. PAL-D Matrix and PAL S/D Switching Circuit

This circuit is further divided into circuits for the R-Y and B-Y signals, but the operation of both circuits is the same. So only the R-Y one will be explained.
R-Y signals input from the demodulator circuit are input to Q20 (BUFF) and Q21 (BUFF).
The signals input to Q21 are then input to pin ② of the analog switcher (IC5). When PAL S has been selected, between pins ② and ⑮ becomes conductive and the signals are supplied to the following circuit via Q33 (BUFF).
The signals input to Q20 are formed by IC7 and Q18.
Bias is controlled by a clamp circuit and is input to pin ⑮ of the 1H delay line (IC3). The DC level of the input is adjusted to the optimum value by using RV9.
IC3, driven by the 10.64 MHz clock signal generated by the clock generator circuit configured with XZ, Q34 and Q35, delays the input signal by 1H cycle and outputs it from pin ⑪.

The high frequency component of the signal thus output is removed by the low-pass filter configured with Q22 and Q23, after which the signal is input to the following PAL-D matrix circuit.
The PAL-D matrix circuit is configured with R100, R101 and Q24.
The signal that was not delayed is input through R100 while the 1H delayed signal is input through R101 at a ratio of 1/2.
The PAL-D signal added to the base of Q24 is obtained from its emitter. The signal obtained from the Q24 emitter is input to pin ① of IC5. When PAL-D is selected, between pins ① and ⑮ becomes conductive and the signal is supplied to the following circuit via Q33 (BUFF).

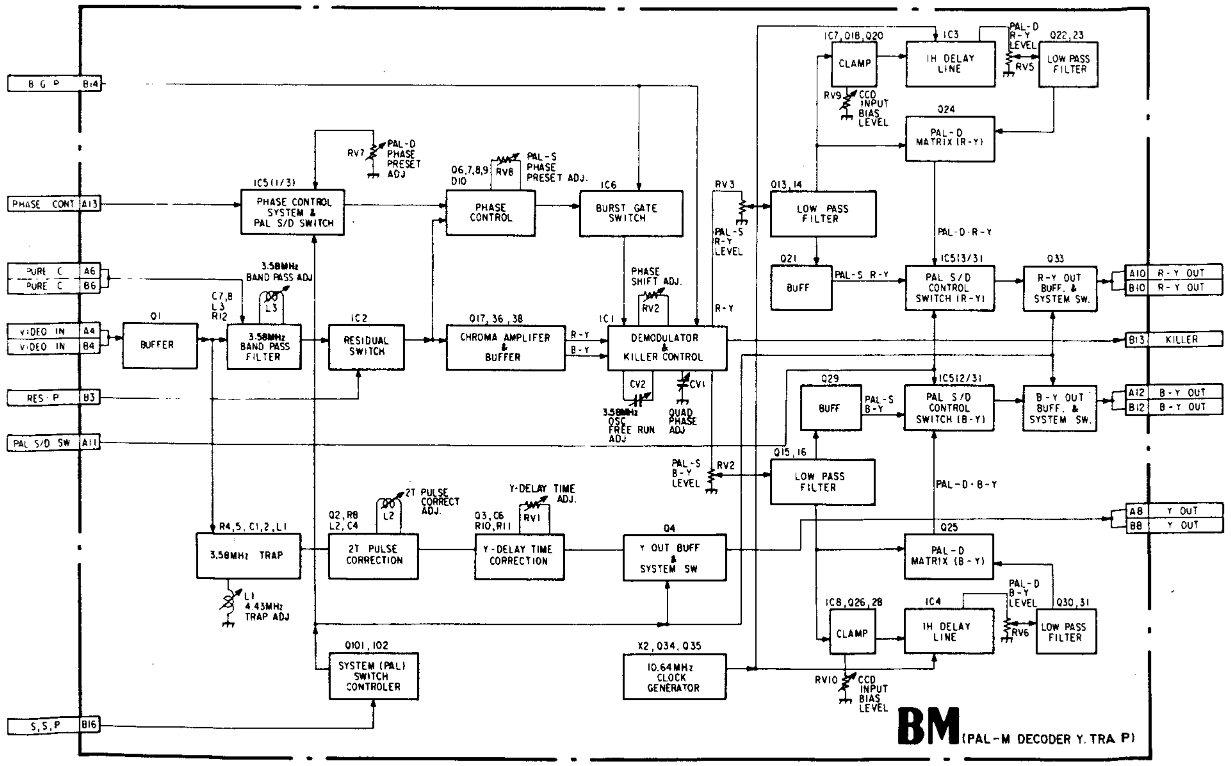
3-11-7. 3.58 MHz Trap Circuit, Phase Compensation, Y Delay Correction Circuit

The composite video signal from the emitter of transistor Q1 is fed to 3.58 MHz trap circuit composed of resistor R5, R6, R7, capacitor C1, C2 and inductor L1.
Adjustment of L1 is made so that the resonance frequency of this trap circuit should be subcarrier frequency.
Y (Luminance) signal removed subcarrier is obtained at output terminal of the trap circuit and is fed to the phase compensation circuit. (Transistor Q2, resistor R8, R9 R10, inductor L2 capacitor C4)
This circuit compensates phase delay of the signal at high frequency due to the trap circuit.
Y signal compensated phase delay is fed to Y-delay circuit. In this circuit Luminance/Chrominance time error is compensated by delay line.

3-11-8. Color Standard Selector

When PAL system is not selected by the COLOR STANDARD SELECTOR in the right side drawer, transistor Q101, Q102 are cut off and ±12V line power source is not supplied to the demodulator circuit.

BLOCK DIAGRAM OF BM (PAL-M) BOARD


B G P B14
PHASE CONT A13
PURE C A6
PURE C B6
VIDEO IN A4
VIDEO IN B4
RES P B3
PAL S/D SW A11
S,S,P B16
Q1
BUFFER
C7,8 L3 R12
3.58MHz BAND PASS ADJ
L3
3.58MHz BAND PASS FILTER
IC2
RESIDUAL SWITCH
IC5(1/3)
PHASE CONTROL SYSTEM & PAL S/D SWITCH
RV7 PAL-D PHASE PRESET ADJ
Q6,7,8,9 D10
RV8 PAL-S PHASE PRESET ADJ.
PHASE CONTROL
IC6
BURST GATE SWITCH
Q17, 36, 38
CHROMA AMPLIFER & BUFFER
R-Y
B-Y
IC1
DEMODULATOR & KILLER CONTROL
PHASE SHIFT ADJ.
RV2
CV2
3.58MHz OSC FREE RUN ADJ
CV1
QUAD PHASE ADJ
R4,5, C1,2,L1
3.58MHz TRAP
L1 4.43MHz TRAP ADJ
Q2, R8 L2, C4
L2
2T PULSE CORRECT ADJ.
2T PULSE CORRECTION
Q3, C6 R10, R11
RV1
Y-DELAY TIME ADJ.
Y-DELAY TIME CORRECTION
Q4
Y OUT BUFF & SYSTEM SW
Q101, 102
SYSTEM (PAL) SWITCH CONTROLER
X2, Q34, Q35
10.64MHz CLOCK GENERATOR
IC7, Q18, Q20
CLAMP
RV9 CCD INPUT BIAS LEVEL
IC3
1H DELAY LINE
PAL-D R-Y LEVEL
RV5
Q22, 23
LOW PASS FILTER
Q24
PAL-D MATRIX (R-Y)
RV3
PAL-S R-Y LEVEL
Q13, 14
LOW PASS FILTER
PAL-D R-Y
Q21
BUFF
PAL-S R-Y
IC5(3/3)
PAL S/D CONTROL SWITCH (R-Y)
Q33
R-Y OUT BUFF. & SYSTEM SW.
A10 R-Y OUT
B10 R-Y OUT
B13 KILLER
Q29
BUFF
PAL-S B-Y
IC5(2/3)
PAL S/D CONTROL SWITCH (B-Y)
B-Y OUT BUFF. & SYSTEM SW.
A12 B-Y OUT
B12 B-Y OUT
PAL-S B-Y LEVEL
RV2
Q15, 16
LOW PASS FILTER
PAL-D B-Y
A8 Y OUT
B8 Y OUT
Q25
PAL-D MATRIX (B-Y)
IC8, Q26, 28
CLAMP
IC4
1H DELAY LINE
PAL-D B-Y LEVEL
RV6
Q30, 31
LOW PASS FILTER
RV10 CCD INPUT BIAS LEVEL
BM (PAL-M DECODER Y. TRA P)

3-12. DA BOARD

- **Waveform Generation circuit (IC2, 7, 8, 9, 11, 18, 24, 25)**

IC2 is a waveform generator. With the input of both horizontal and vertical sync signals, this IC generates the following signals:

- H rate saw tooth waveform signal (HS)
- H rate parabolic waveform signal (HP)
- V rate saw tooth waveform signal (VS)
- V rate parabolic waveform signal (VP)
- Modulated waveform signal
- H saw × V saw (HS × VS)
- H saw × V parabola (HS × VP)
- H parabola × V saw (HP × VP)
- H parabola × V parabola (HP × VP)
- H.SW PULSE, V.SW PULSE

H.SW and V.SW pulses are those which rise just in the middle of the trace period and fall in the retrace period.

- **Scan Switching circuit (IC3, 4, 5, 6)**

In the scan switching circuit, NORMAL, UNDER or SET-UP scanning is performed.

In H.SAW GEN. circuit, the H rate saw wave is output by the integrator of IC15 using the H.SW pulses from IC2 as reset pulses. The H rate saw thus generated is delayed about 1/2H as compared with that of the IC2.

- **H.BLK. GEN., H. DRIVE GEN. circuit (IC17, 18)**

In the H.BLK.GEN. circuit, the H.BLK.P required for horizontal blanking is generated from the H.SAW waveform signal which is output signal of IC13. The HV.DRIVE GEN. is the same. In the H.Delay and H.PHASE circuits, like H.BLK.GEN., the D.AFC.P is output by comparating the H.SAW output signals of IC13. Further, this circuit performs H. PHASE and H.DELAY by not changing the pulse width of D.AFC.P but changing only the position.

- **SIN. GEN., COS. GEN. circuits (IC7, 8)**

In the SIN.GEN. and COS.GEN. circuits, the SIN approximate wave is output by integrating the V rate parabola once and the COS spproximate wave is output by integrating it twice.

- **H.WIDTH circuit (IC3, 11)**

In the H.WIDTH circuit, the correction waveforms such as SIDE PIN, SIDE PIN TILT, H.WIDTH, etc. are output by adding VP, VS, H, SIZE, etc. (H.WIDTH)

- **H. LIN circuit (IC13)**

In the H.LIN circuit, correction waveforms such as H.LIN.GAIN, H. LIN. BALANCE, etc are output by adding HP, HS, etc. (H.LIN)

- **V SAW circuit (IC12)**

In the V.SAW circuit, the correction waveforms such as V cycle saw wave, V.LIN. GAIN, V.LIN. BALANCE, V GEN.T.X BOW, TOP BOTTOM PIN, etc. are output by adding VS, DC, V.SIN, VP, HS, HS × VS, etc. (V.SAW)

- **H.CENT circuit (IC16)**

In the H.CENT circuit, the correction waveforms of H.CENT, Y BOW, Y. TILT are output by adding DC, VP and VS.

- **X.CONV circuit (IC9, 14)**

In the X.CONV circuit, the correction waveform of vertical misconvergence is output by adding VP and DC which are generated separately in upper side and lower side of the picture screen.

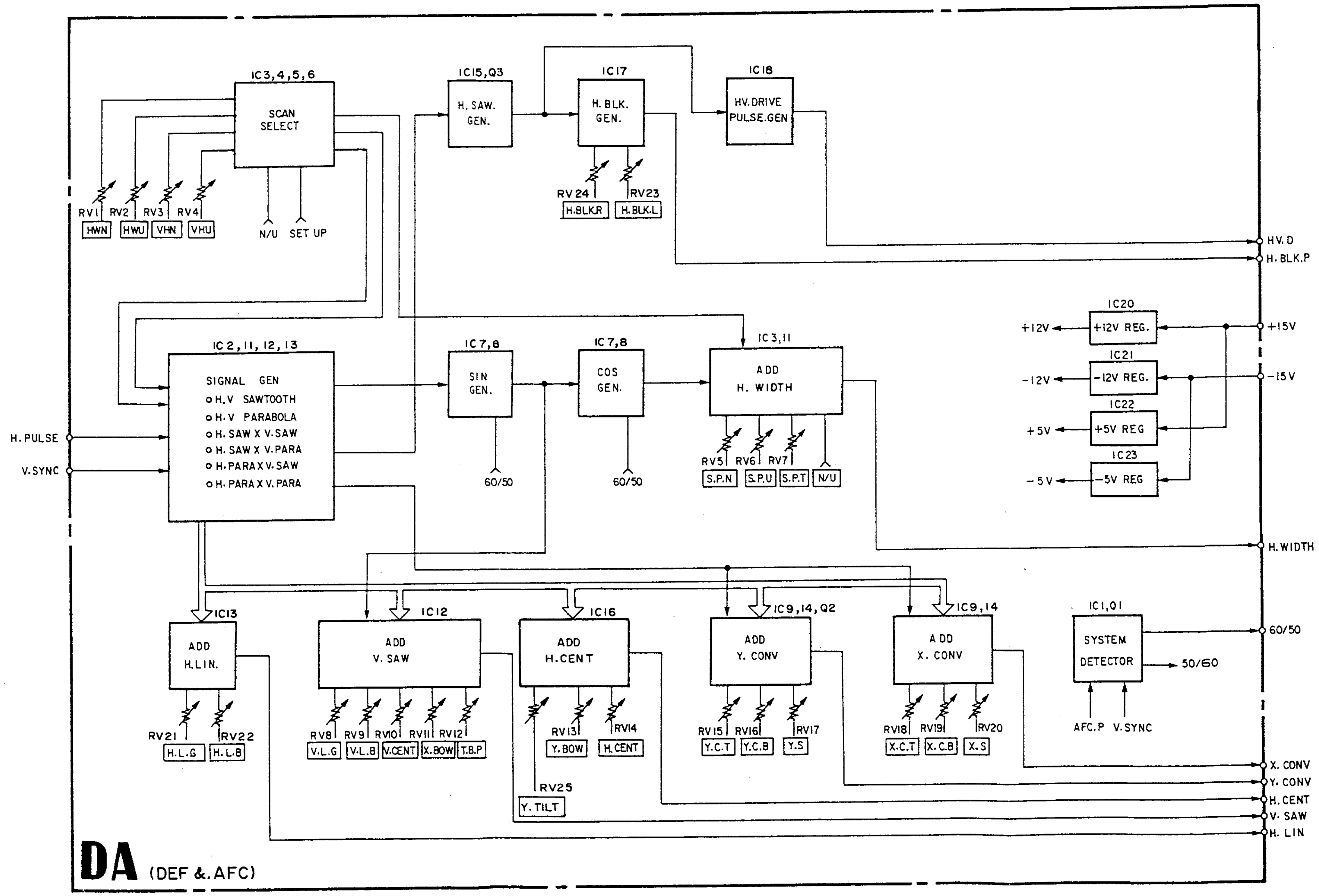
- **Y.CONV circuit (IC9, 14, Q2)**

In the Y.CONV circuit, the correction waveform of horizontal misconvergence is output by adding VP and DC which are generated separately in upper side and lower side of the picture screen.

- **System Detector circuit (IC1, Q1)**

With the input at both horizontal and vertical sync signals IC1 distingwishes between 525/60 and 625/50.

BLOCK DIAGRAM OF DA BOARD


IC3,4,5,6
SCAN SELECT
RV1 RV2 RV3 RV4
HWN HWU VHN VHU
N/U SET UP
IC15,Q3
H. SAW. GEN.
IC17
H. BLK. GEN.
RV24 RV23
H.BLK.R H.BLK.L
IC18
HV. DRIVE PULSE.GEN
HV. D
H. BLK.P
IC2, 11, 12, 13
SIGNAL GEN
o H.V SAWTOOTH
o H.V PARABOLA
o H. SAW X V. SAW
o H. SAW X V. PARA
o H. PARA X V. SAW
o H. PARA X V. PARA
H. PULSE
V. SYNC
IC7,8
SIN GEN.
60/50
IC7,8
COS GEN.
60/50
IC3,11
ADD H. WIDTH
RV5 RV6 RV7
S.P.N S.P.U S.P.T N/U
IC20
+12V REG.
+12V
+15V
IC21
-12V REG.
-12V
-15V
IC22
+5V REG
+5V
IC23
-5V REG
-5V
H. WIDTH
IC13
ADD H.LIN.
RV21 RV22
H.L.G H.L.B
IC12
ADD V. SAW
RV8 RV9 RV10 RV11 RV12
V.L.G V.L.B V.CENT X.BOW T.B.P
IC16
ADD H.CENT
RV13 RV14
Y.BOW H.CENT
RV25
Y. TILT
IC9,14,Q2
ADD Y. CONV
RV15 RV16 RV17
Y.C.T Y.C.B Y.S
IC9,14
ADD X. CONV
RV18 RV19 RV20
X.C.T X.C.B X.S
IC1,Q1
SYSTEM DETECTOR
60/50
50/60
AFC.P V.SYNC
X. CONV
Y. CONV
H. CENT
V. SAW
H. LIN
DA (DEF &.AFC)

3-13. HORIZONTAL AND VERTICAL DEFLECTION OUTPUT CIRCUIT AND HIGH VOLTAGE REGULATOR CIRCUIT (EA BLOCK)

3-13-1. Horizontal Deflection Output Circuit

The horizontal deflection output circuit controls H out of Q11, driving T2 at Q10 by the H drive pulse generated on the board DB.
The power supply circuit to H out improves the power supply efficiency using −150V and DC-DC converter with IC1 and Q7. IC1 consists of the error amplifier and the P.W.M. circuit. IC1, being supplied with the side pin-cushion correction waveform and the H. width adjusting voltage from the board DA controls the DC-DC converter output.

3-13-2. H. Center Adjusting Circuit

The H. center adjusting circuit, generating a ± power source from the secondary output of T3 (H.O.T.), flows the correction current of the horizontal center position and Y bow bend to the horizontal deflection yoke.

3-13-3. H. Linearity Correction Circuit

The H. LIN. circuit amplifies the H. LIN. correction waveform generated on the board DA by the SEPP amplifiers of Q2 to Q5. and supplies these to the horizontal deflection yoke from the capacitor for S curve correction.

3-13-4. Vertical Deflection Output Circuit

The vertical deflection output circuit consists of the SEPP AMP, directly connected to DC power and composed of Q201 to Q205 and the retrace pulse voltage boost-up circuit composed of Q207 and Q208.
This SEPP AMP receives, as an input the sawtooth wave voltage (added with the T&B pincushion compensating voltage and the vertical linearity compensating voltage) generated at the DA board.
Since the SEPP AMP is directly connected to the load (V.DY), the V. CENT circuit needs only DC current supplied to V sawtooth from ± power supply. The boost-up circuit is turned on by the V.D signal and supplies energy to the output circuit during the vertical retrace period.

3-13-5. High Voltage Regulator Circuit

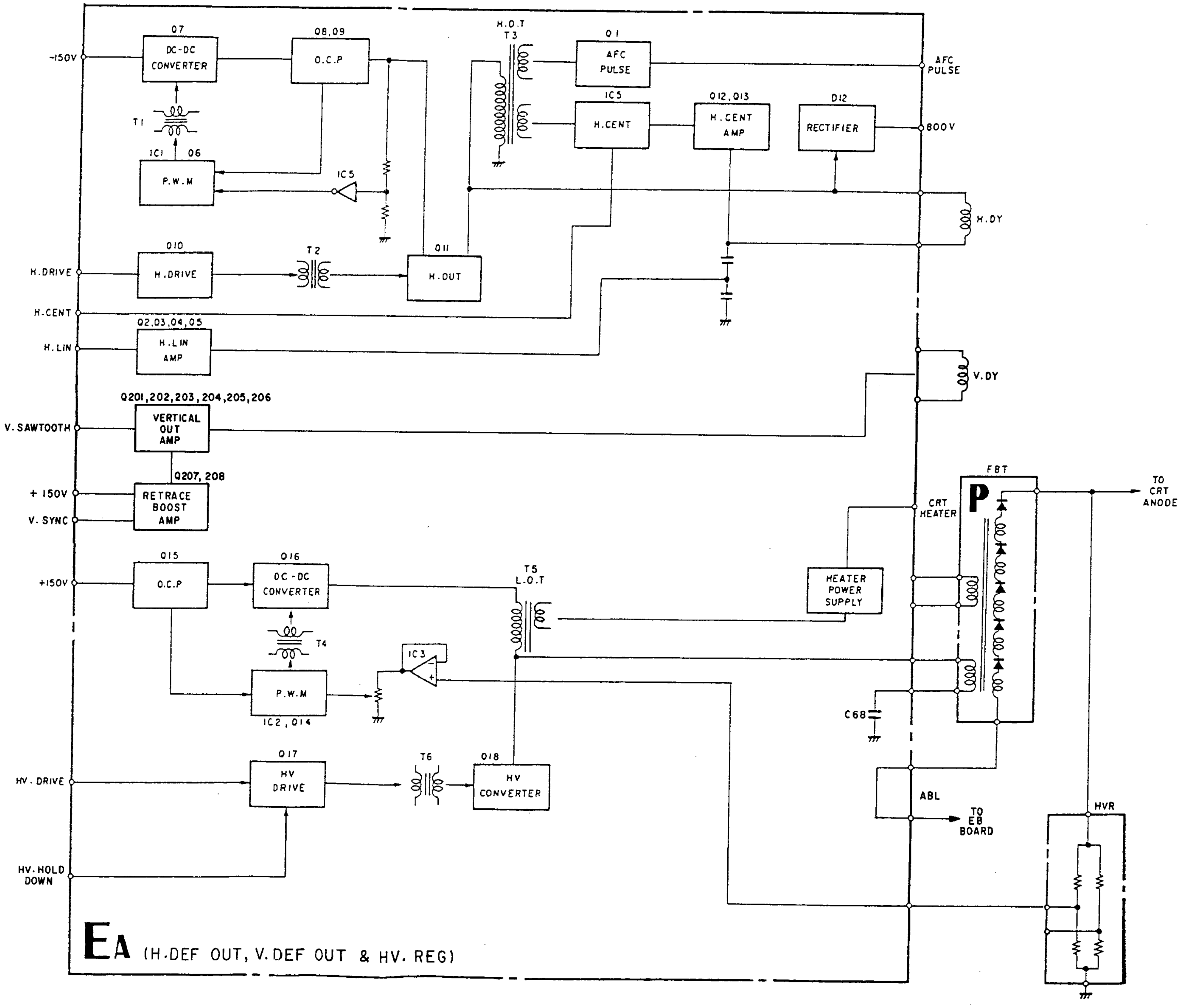
The high voltage regulator of this unit uses the DC-DC converter type power supply circuit in order to reduce power consumption. In general, the movement of the high voltage regulator is as follows:
The high voltage regulator consists of Q16, Q18, IC3 (1/2), IC2 (IC for P.W.M. control) and HVR.
The detection voltage is obtained by directly dividing HV voltage with resistors in HVR.
IC2 compares this detection voltage with the reference voltage located outside IC2 (error amplification) and performs P.W.M. modulation. Q16 is driven by output of IC2 which is made PWM modulation and controls the voltage supplied to the FBT drive circuit (Q17, Q18, FBT).
The HV voltage is adjusted by changing the detection voltage. Since the detection voltage of HVR drops when the anode current is increasing and the high voltage drops, then the ON period of Q16 is widened.
As a result of this, as the peak current of the corrector current of Q18 increases, the energy which is stored in C68 via FBT is enlarged and the high voltage is regulated by increasing electric potential of C68.

When Q18 is turned off, a flyback pulse is generated by the synthesized resonance action by inductance of L.O.T, F.B.T and the C65, C66, C67 then, the HV voltage is generated by transfered the flyback pulse to the secondary side. (See Figure)

3-13-6. CRT Heater Power Source

The CRT heater power source is supplied from the secondary winding of L.O.T.

BLOCK DIAGRAM OF EA BOARD


-150V
Q7
DC-DC CONVERTER
Q8,Q9
O.C.P
T1
IC1
Q6
P.W.M
IC5
H.O.T
T3
Q1
AFC PULSE
IC5
H.CENT
Q12,Q13
H.CENT AMP
D12
RECTIFIER
AFC PULSE
800V
H.DY
H.DRIVE
Q10
H.DRIVE
T2
Q11
H.OUT
H.CENT
Q2,Q3,Q4,Q5
H.LIN
H.LIN AMP
V.DY
Q201,202,203,204,205,206
V.SAWTOOTH
VERTICAL OUT AMP
Q207, 208
+150V
V.SYNC
RETRACE BOOST AMP
Q15
Q16
+150V
O.C.P
DC-DC CONVERTER
T4
P.W.M
IC2, Q14
IC3
T5
L.O.T
FBT
P
TO CRT ANODE
CRT HEATER
HEATER POWER SUPPLY
C68
Q17
HV DRIVE
T6
Q18
HV CONVERTER
HV.DRIVE
HV.HOLD DOWN
ABL
TO EB BOARD
HVR
EA (H.DEF OUT, V.DEF OUT & HV.REG)

3-14. H.OSCILLATOR AND H.FREQUECY CONTROL (DB BOARD)

IC204 is an IC which incorporates the H.OSC and H.AFC circuits. In this IC, the frequency and phase of H.OSC are controlled by comparing the phases of D.AFC.P and H.SYNC. This unit can vary the AFC time constant by the AFC. sw.

3-15. HIGH VOLTAGE PROTECTOR CIRCUIT, BEAM CURRENT PROTECTOR CIRCUIT AND CRT PROTECTOR CIRCUIT (EB BOARD)

3-15-1. High Voltage Protector

The detection voltage for the high voltage protector is obtained by directly by dividing HV voltage with resistors in HVR.

For the high voltage protector circuit when this ditection voltage rises more than the reference voltage by the high voltage rise output of the comparator IC4 (1/2) becomes high and the drive pulse of the high voltage converter is cut off by making D27 (SCR) gate on. Consequently, the high voltage output circuit is stopped.

3-15-2. Beam Current Protector ①

The anode current is converted to the voltage by resistor R121 in which the current flows in the secondary winding of FBT.

For the high voltage current protector, when the anode current increases extraordinarily, the output of comparator IC4 (2/2) becomes high and the drive pulse of the high voltage converter is cut off by making D27 (SCR) gate on. Consequently, the high voltage output circuit is stopped.

3-15-3. Beam Current Protector ②

The anode current is converted to the voltage by resistor R124 in which the current flows in the secondary winding of FBT.

For the high voltage current protector, when the anode current increases extraordinarily, the output of comparator IC6 (1/2) becomes high and the drive pulse of the high voltage converter is cut off by making D51 (SCR) gate on. Consequently, the high voltage output circuit is stopped.

3-15-4. CRT Protector

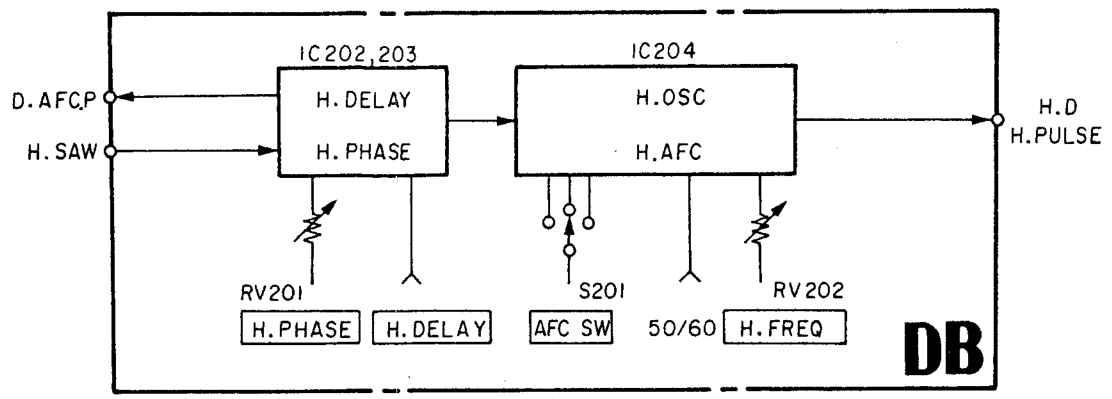
The CRT protector circuit is to prevent the CRT from burning when the vertical deflection circuit is stopped by some causes.

For the CRT protector circuit, because the retrance pulse of V out disappears when the vertical deflection circuit is stopped, Q20 is turned off and the output of comparator IC6 (2/2) becomes high, then, with D27 (SCR) gated on to cut off the drive pulse of the high voltage converter circuit, the high voltage output circuit is stopped.

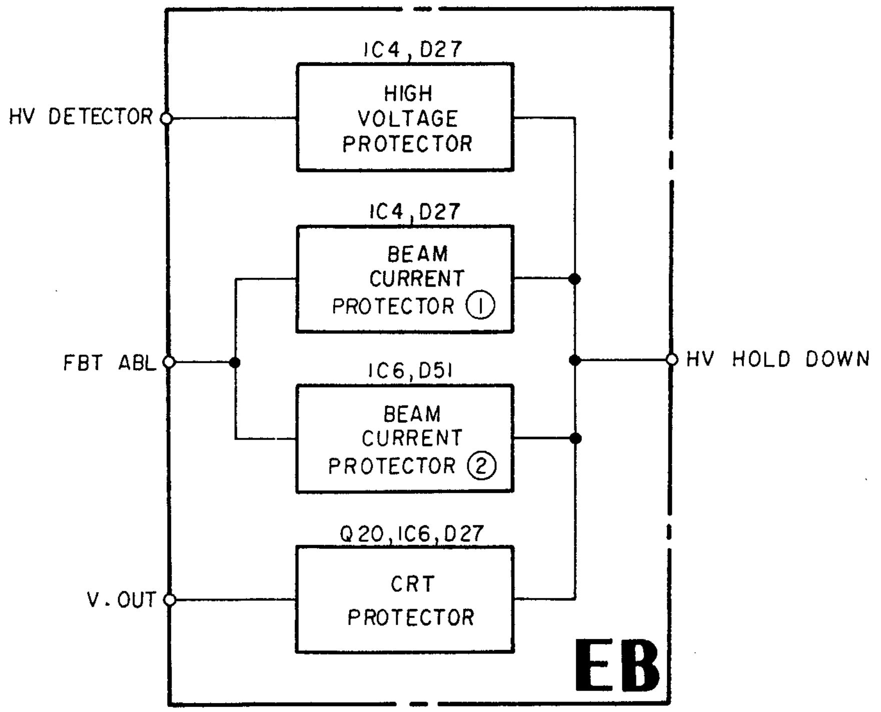
3-16. VERTICAL CONVERGENCE OUTPUT CIRCUIT (EC BOARD)

The vertical convergence output circuit drive the neck twist coil. The correction waveforms of vertical misconvergence is generated on the DA BOARD.

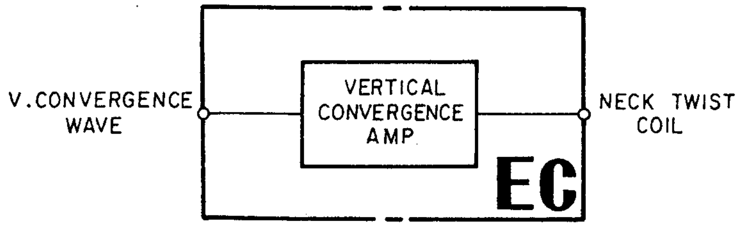
BLOCK DIAGRAM OF DB BOARD


IC202,203
H. DELAY
H. PHASE
IC204
H.OSC
H.AFC
D.AFC.P
H.SAW
H.D
H.PULSE
RV201
H.PHASE
H.DELAY
S201
AFC SW
50/60
RV202
H.FREQ
DB

BLOCK DIAGRAM OF EB BOARD


IC4, D27
HIGH VOLTAGE PROTECTOR
IC4, D27
BEAM CURRENT PROTECTOR ①
IC6, D51
BEAM CURRENT PROTECTOR ②
Q20, IC6, D27
CRT PROTECTOR
HV DETECTOR
FBT ABL
V. OUT
HV HOLD DOWN
EB

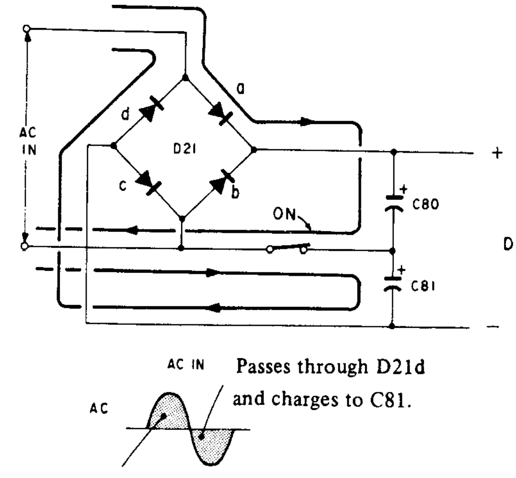
BLOCK DIAGRAM OF EC BOARD


VERTICAL CONVERGENCE AMP
V.CONVERGENCE WAVE
NECK TWIST COIL
EC

3-17. POWER SUPPLY CIRCUIT (GA, GB BOARDS)

3-17-1. AC Power Supply, Rectifier Circuit

Voltage selector located at the rear side of the unit should be selected to the local line voltage (AC 100/120V or 220/240V).
In case of AC 100/120V selected by voltage selector, rectifier D21 capacitors C80 and C81 operate as a double multiple rectifier.
See Figure 18(a).
In case of AC 220/240V selected by voltage selector, rectifier D21 capacitors C80 and C81 operate as a full-wave rectifier.
See Figure 18(b).


AC IN
D21
a
b
c
d
ON
C80
C81
+
DC
−
AC IN
AC

Passes through D21d and charges to C81.

Passes through D21a and charges to C80.

Figure 18(a)

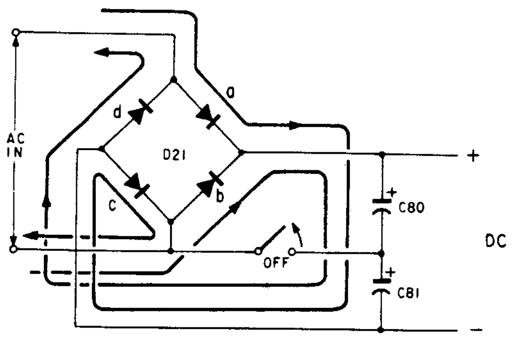

AC IN
D21
a
b
c
d
OFF
C80
C81
+
DC
−

Figure 18(b)

3-17-2. Degauss Circuit

There are 2 posistors (PTH1, PTH2) in the degaussing circuit. One is used for AC 100/120V operation, the other is for AC 220/240V operation, these posistors are switched by voltage selector.
This degaussing circuit is turned ON and OFF by using Relay (RY1) automatically.
When power is turned ON, Automatic degaussing starts to work and a few seconds later stops automatically.
Also Manual degaussing is available if necessary after a few minutes power is turned on when posistor (PTH1 or PTH2) gets cool down.
This manual degaussing is operated by a push of button (Degauss Switch) at the left of the front panel.
When degaussing circuit starts to work, Q11 transistor turns on by time constant circuit composed of resistors R88, 91 and capacitor C74. Q11 drives Q12 transistor. Relay (RY1) is driven by Q12.
Time constant circuit keeps degaussing circuit to activate for several seconds until degaussing is finished.

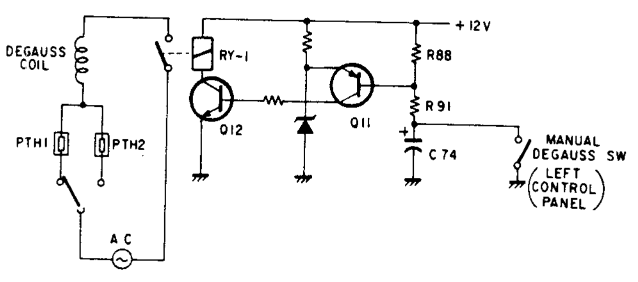

DEGAUSS COIL
RY-1
+12V
R88
R91
Q12
Q11
C74
PTH1
PTH2
AC
MANUAL DEGAUSS SW
(LEFT CONTROL PANEL)

Figure 19

3-17-3. Starter Circuit

Blocking oscillator composed of integrated circuit IC1 and transformer T4 operates when power is turned on. DC voltage obtained by diode D7 and capacitor C57 as a rectifier at the secondary circuit of T4 is supplied to IC2 and IC3, when AC voltage is higher than 50 ~ 70V (voltage selector at 100/120V position). Then power supply regulator starts to work and +15V line power supply is provided to IC2 and IC3 via diode D20, also voltage from T4 stops providing power supply to IC2 and IC3 because blocking oscillator is shut down by voltage generated at primary windings of SRT (Switching Regulator Transformer).

3-17-4. Switching Regulator Circuit

Block diagram is shown in Figure 20. This is half bridge type of switching regulator in this model.

Following Description is the Theory of Half-Bridge Switching Regulator.

DC voltage E_{IN} rectified from AC voltage in AC power rectifier section is divided by capacitor C1 and C2. C1 and C2 have almost same value. Q1 (contains 2 transistors) operates as a switch driven by PWM modulated pulse via T2 (Drive Transformer). Switching current flows through primary windings of T1 (SRT) by switching transistor Q1 via T3 (Current Transformer).
Thus output voltages are generated at secondary windings of T1.

Practical Circuit Used in this Model

There are 2 switching regulators in this power supply. One is for low voltage power supply, ±15V, ±18V and +5V. The other is for high voltage ±150V power supply.
Low voltages are generated by IC2, T1, T2, T3 and Q1.
High voltages are generated by IC3, T6, T7 and Q2
Refer to block diagram
Current Transformer T3 and T7 detects excess current in transistor Q1 and Q2 for the protection of damage.

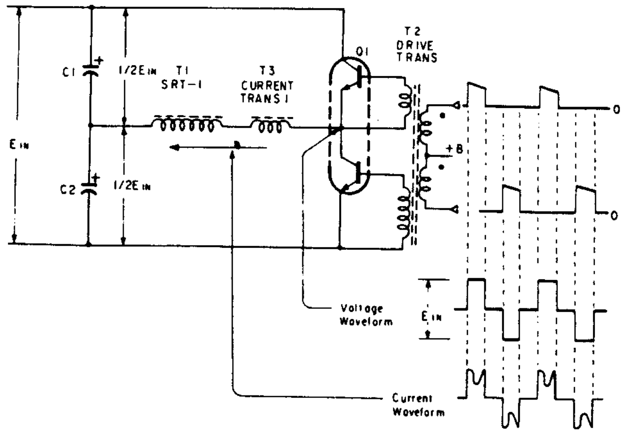
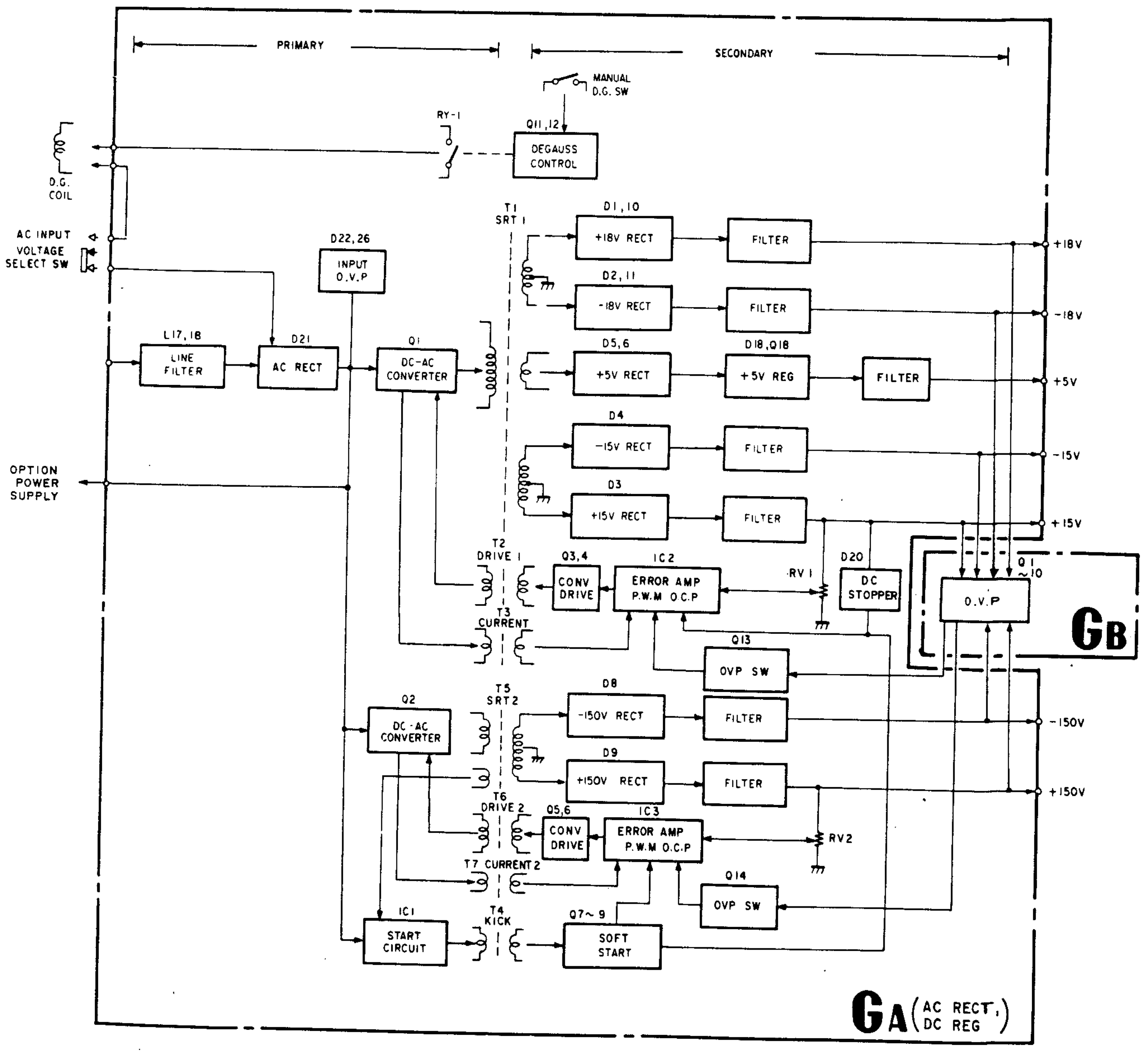

C1
C2
1/2E IN
T1 SRT-1
T3 CURRENT TRANS I
E IN
Q1
T2 DRIVE TRANS
0
+8
0
Voltage Waveform
E IN
Current Waveform

Figure 20

3-17-5. Over Voltage Protector

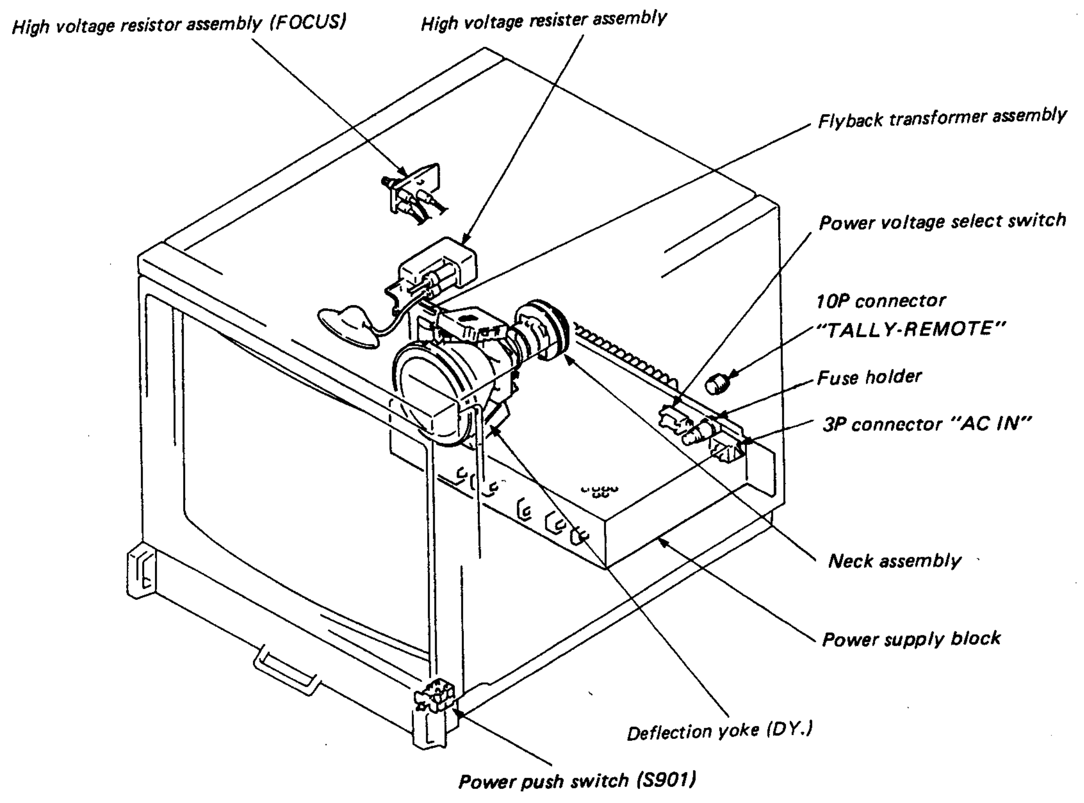
Daughter board GB is mounted in mother board GA.
GB board works for over voltage protection.
When output voltage gets higher value than predetermined value, over voltage protector activates to prevent damage of unit.

BLOCK DIAGRAM OF GA, GB BOARD

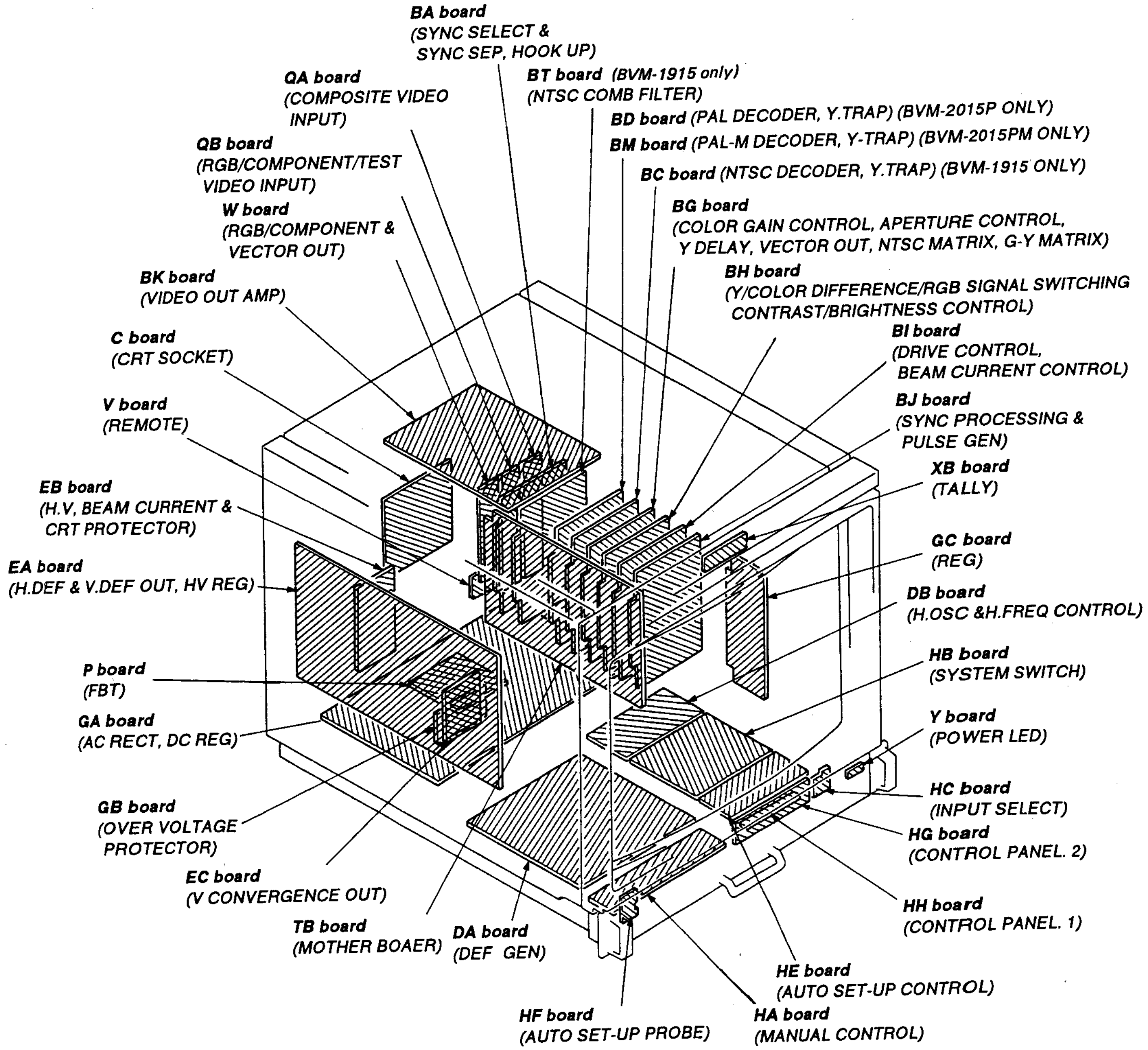

PRIMARY
SECONDARY
MANUAL D.G. SW
RY-1
Q11,12
DEGAUSS CONTROL
D.G. COIL
AC INPUT
VOLTAGE SELECT SW
D22,26
INPUT O.V.P
L17,18
LINE FILTER
D21
AC RECT
Q1
DC-AC CONVERTER
T1 SRT 1
D1,10
+18V RECT
FILTER
+18V
D2,11
-18V RECT
FILTER
-18V
D5,6
+5V RECT
D18,Q18
+5V REG
FILTER
+5V
D4
-15V RECT
FILTER
-15V
D3
+15V RECT
FILTER
+15V
OPTION POWER SUPPLY
T2 DRIVE 1
Q3,4
CONV DRIVE
IC2
ERROR AMP P.W.M O.C.P
RV1
D20
DC STOPPER
Q1~10
O.V.P
GB
T3 CURRENT
Q13
OVP SW
Q2
DC-AC CONVERTER
T5 SRT2
D8
-150V RECT
FILTER
-150V
D9
+150V RECT
FILTER
+150V
T6 DRIVE 2
Q5,6
CONV DRIVE
IC3
ERROR AMP P.W.M O.C.P
RV2
T7 CURRENT 2
Q14
OVP SW
IC1
START CIRCUIT
T4 KICK
Q7~9
SOFT START
GA (AC RECT, DC REG)

SECTION 4
ADJUSTMENTS

4-1. INTERNAL VIEW


High voltage resistor assembly (FOCUS)
High voltage resister assembly
Flyback transformer assembly
Power voltage select switch
10P connector
"TALLY-REMOTE"
Fuse holder
3P connector "AC IN"
Neck assembly
Power supply block
Deflection yoke (DY.)
Power push switch (S901)

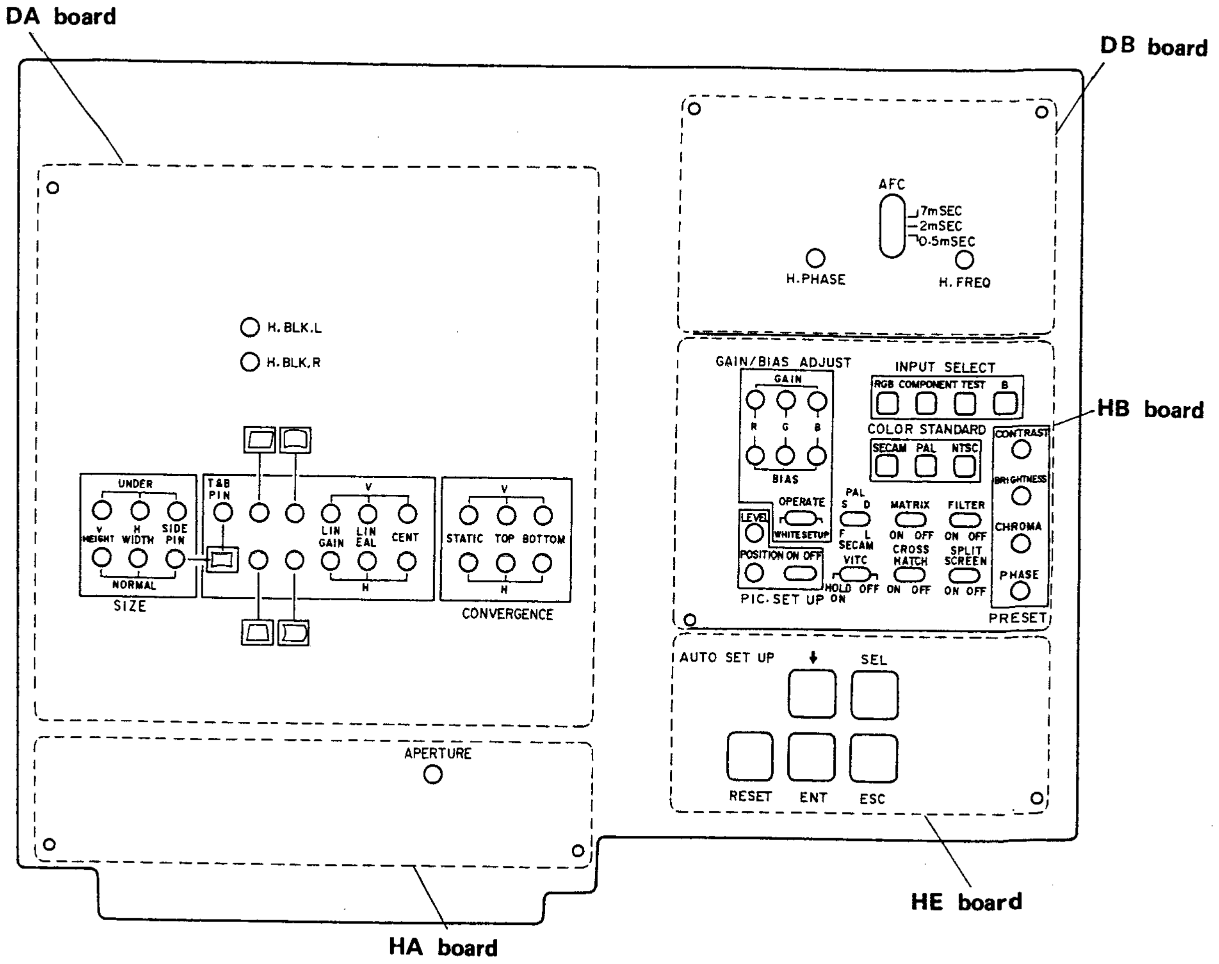
4-2. CIRCUIT BOARDS LOCATION


BA board
(SYNC SELECT &
SYNC SEP, HOOK UP)
QA board
(COMPOSITE VIDEO
INPUT)
BT board (BVM-1915 only)
(NTSC COMB FILTER)
BD board (PAL DECODER, Y.TRAP) (BVM-2015P ONLY)
BM board (PAL-M DECODER, Y-TRAP) (BVM-2015PM ONLY)
QB board
(RGB/COMPONENT/TEST
VIDEO INPUT)
BC board (NTSC DECODER, Y.TRAP) (BVM-1915 ONLY)
W board
(RGB/COMPONENT &
VECTOR OUT)
BG board
(COLOR GAIN CONTROL, APERTURE CONTROL,
Y DELAY, VECTOR OUT, NTSC MATRIX, G-Y MATRIX)
BK board
(VIDEO OUT AMP)
BH board
(Y/COLOR DIFFERENCE/RGB SIGNAL SWITCHING
CONTRAST/BRIGHTNESS CONTROL)
C board
(CRT SOCKET)
BI board
(DRIVE CONTROL,
BEAM CURRENT CONTROL)
V board
(REMOTE)
BJ board
(SYNC PROCESSING &
PULSE GEN)
XB board
(TALLY)
EB board
(H.V, BEAM CURRENT &
CRT PROTECTOR)
GC board
(REG)
EA board
(H.DEF & V.DEF OUT, HV REG)
DB board
(H.OSC &H.FREQ CONTROL)
P board
(FBT)
HB board
(SYSTEM SWITCH)
GA board
(AC RECT, DC REG)
Y board
(POWER LED)
HC board
(INPUT SELECT)
GB board
(OVER VOLTAGE
PROTECTOR)
HG board
(CONTROL PANEL. 2)
EC board
(V CONVERGENCE OUT)
HH board
(CONTROL PANEL. 1)
TB board
(MOTHER BOAER)
DA board
(DEF GEN)
HE board
(AUTO SET-UP CONTROL)
HF board
(AUTO SET-UP PROBE)
HA board
(MANUAL CONTROL)

4-3. QUICK REFERENCE

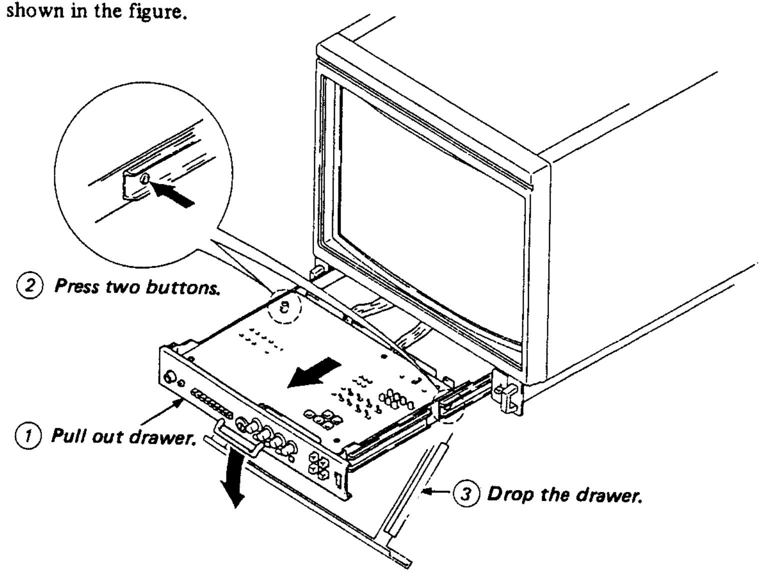
BOARD / SECTION	BA	BT	BC	BG	BH	BI	BJ	BK	BD/BM	DA	DB	EA
CIRCUIT DISCRIPTION	3-1	3-17	3-19	3-3	3-5	3-7 3-15	3-9	3-13 3-15	3-21 3-23	3-25	3-29	3-27
ADJUSTMENTS	4-21 4-23	4-47	4-31 4-35	4-21 4-27	4-21	4-16	4-19 4-30 4-44	4-45	4-61	4-76	4-79	4-14
BLOCK DIAGRAM	3-2	3-18	3-20	3-4	3-5	3-7	3-9	3-13	3-22 3-24	3-25	3-29	3-27
MOUNTING DIAGRAM	5-11	5-16	5-21	5-31	5-39	5-41	5-49	5-51	5-29	5-59	5-61	5-65
SCHEMATIC DIAGRAM	5-13	5-19	5-23	5-33	5-37	5-43	5-47	5-53	5-27	5-57	5-56	5-62
ELECTRICAL PARTS LIST	7-1	7-19	7-3	7-9	7-11	7-13	7-15	7-17	7-5	7-23	7-25	7-26
BOARD / SECTION	**EB**	**EC**	**GA**	**GB**	**C**	**P**	**HA**	**HB**	**HC**	**HE**	**HF**	**HG**
CIRCUIT DISCRIPTION	3-29	3-29	3-31	3-31	—	—	—	—	—	—	—	—
ADJUSTMENTS	4-14	—	4-11	—	—	—	—	4-18 4-21	—	—	—	—
BLOCK DIAGRAM	3-29	3-29	3-32	3-32	—	3-28	—	—	—	—	—	—
MOUNTING DIAGRAM	5-67	5-67	5-71	5-73	5-67	5-67	5-75	5-74	5-75	5-74	5-76	5-76
SCHEMATIC DIAGRAM	5-64	5-64	5-69	5-70	5-64	5-64	5-78	5-77	5-77	5-78	5-78	5-77
ELECTRICAL PARTS LIST	7-28	7-29	7-29	7-32	7-23	7-34	7-33	7-33	7-33	7-33	7-34	7-34
BOARD / SECTION	**HH**	**XB**	**Y**	**GC**	**QA**	**V**	**W**	**QB**	**TB**			
CIRCUIT DISCRIPTION	—	—	—	—	3-1	—	—	3-1	—			
ADJUSTMENTS	—	—	—	—	—	—	—	—	—			
BLOCK DIAGRAM	—	—	—	—	3-2	—	—	3-2	—			
MOUNTING DIAGRAM	5-76	5-76	5-76	5-81	5-81	5-82	5-81	5-81	5-85			
SCHEMATIC DIAGRAM	5-77	5-78	5-78	5-79	5-79	5-80	5-80	5-80	5-83			
ELECTRICAL PARTS LIST	7-34	7-35	7-35	7-32	7-34	7-35	7-35	7-34	7-35			

4-4. SUB CONTROL PANEL LOCATION


DA board
DB board
HB board
HE board
HA board
AFC
7mSEC
2mSEC
0.5mSEC
H.PHASE
H.FREQ
H.BLK.L
H.BLK.R
UNDER
V HEIGHT
H WIDTH
SIDE PIN
NORMAL
SIZE
T&B PIN
V
LIN GAIN
LIN EAL
CENT
H
STATIC
TOP
BOTTOM
CONVERGENCE
APERTURE
GAIN/BIAS ADJUST
GAIN
R G B
BIAS
OPERATE
WHITE SETUP
LEVEL
POSITION ON OFF
PIC·SET UP
INPUT SELECT
RGB COMPONENT TEST B
COLOR STANDARD
SECAM PAL NTSC
PAL S D
F L SECAM
VITC HOLD ON OFF
MATRIX ON OFF
CROSS HATCH ON OFF
FILTER ON OFF
SPLIT SCREEN ON OFF
CONTRAST
BRIGHTNESS
CHROMA
PHASE
PRESET
AUTO SET UP
SEL
RESET
ENT
ESC

ADJUSTING METHOD OF DRAWER BLOCK

* Pull out sub-control panel and press two stopper buttons to drop it 60° as shown in the figure.


② Press two buttons.
① Pull out drawer.
③ Drop the drawer.

4-5. SETUP ADJUSTMENT IN CASE OF PICTURE TUBE REPLACEMENT

When the picture tube has been replaced, make the following adjustments. Convergence and white balance are normally adjusted by the potentiometers on the sub control panel.

[Jigs Tools and Measurement Equipment Required]

1. SIGNAL GENERATOR (TEKTRONOX 1410, 1411 ans 1412 Series)
2. COLOR ANALYZER
3. LUMINANCE METER

[Landing adjustment]

1. Connect signal generator and receive a white signal.
2. Set BRIGHTNESS and CONTRAST VRs to the preset position (⊓).
3. Face the CRT screen toward East (or West) and press the DEGAUSS switch.
4. Set the purity control to the center as shown in Fig. 1-1.

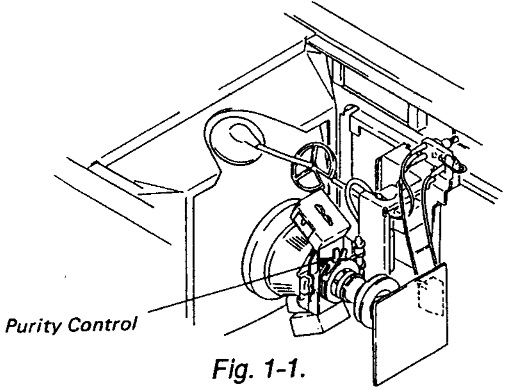

Purity Control

Fig. 1-1.

5. Slide DY (Deflection Yoke) as far forward as possible.
6. Set the neck assembly in the position shown in Fig. 1-2.

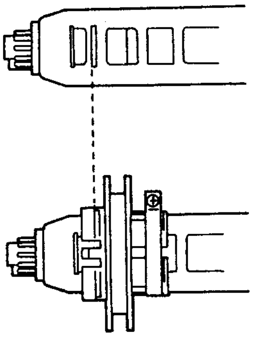


Fig. 1-2.

7. Set the screen to green only (R and B on the FRONT PANEL are in the IN position and G in the OUT position).
8. Turn purity knob as shown in Fig. 1-3 to bring the green on the center of the screen.

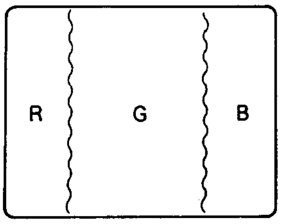


Fig. 1-3.

9. Slide DY back for uniform green raster.
10. Make the screen red only (G and B on the FRONT PANEL are in the IN position and R in the OUT position) and check landing.
11. Make the screen blue only (R and G on the FRONT PANEL are in the IN position and B in the OUT position) and check landing.
12. Adjust DY tilt and tighten DY set-screw.
13. Secure the DY with the spacers. (Fig. 1-4)

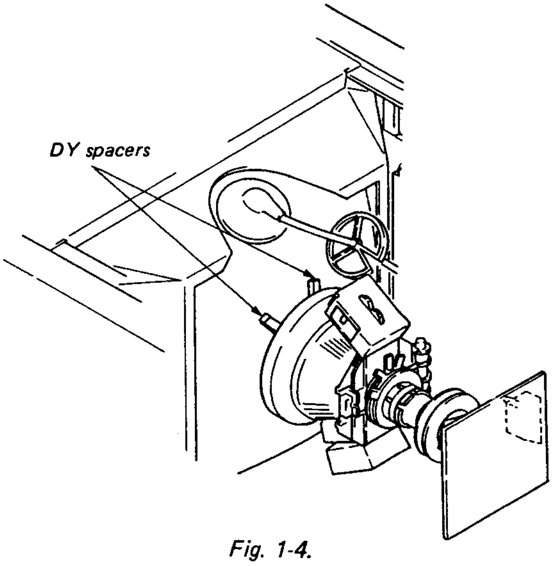
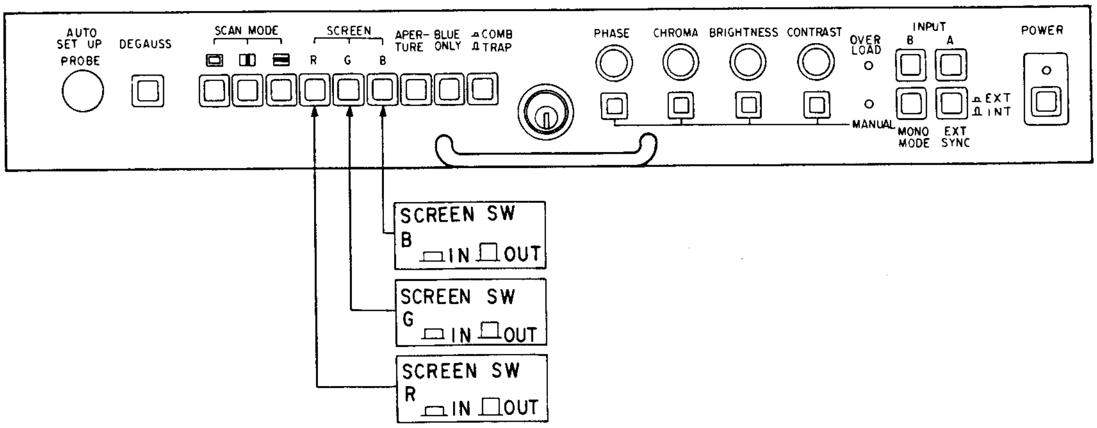


Fig. 1-4.

- **Final check**

  After adjustments, check that there is no mislanding by facing the CRT towards East, West, North and South directions.

FRONT PANEL


AUTO SET UP PROBE
DEGAUSS
SCAN MODE
SCREEN
R
G
B
APER-TURE
BLUE ONLY
COMB
TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
MANUAL
INPUT
B
A
EXT
INT
MONO MODE
EXT SYNC
POWER
SCREEN SW B IN OUT
SCREEN SW G IN OUT
SCREEN SW R IN OUT

[Convergence adjustment]

Preparation:

1. Connect the signal generator to receive the dot signal and crosshatch signal.
2. Adjust with CONTRAST and BRIGHTNESS controls to set to easy-to-monitor position those signals.
3. Set H.STATIC VR (RV17) on the sub control panel of DA Board to the mechanical center.

(1) Horizontal and Vertical Static Convergence

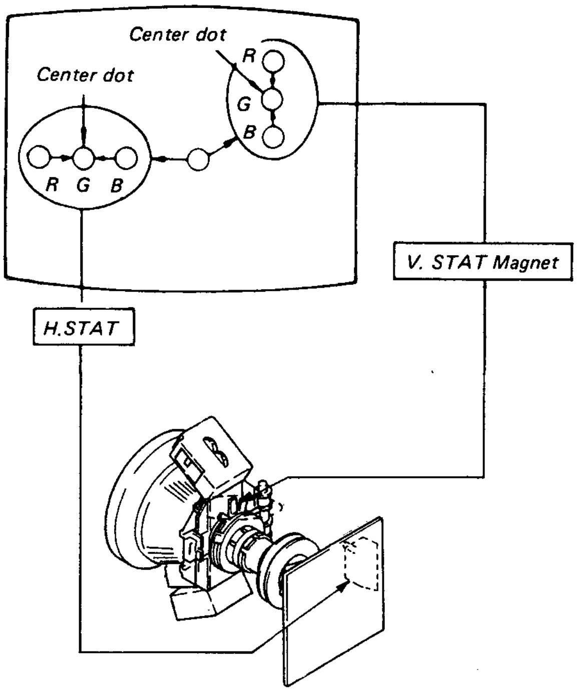
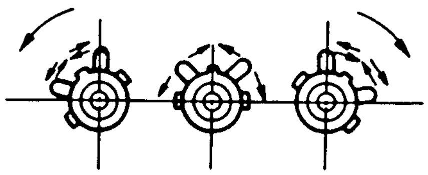

Center dot
Center dot
R
G
B
R G B
V. STAT Magnet
H.STAT

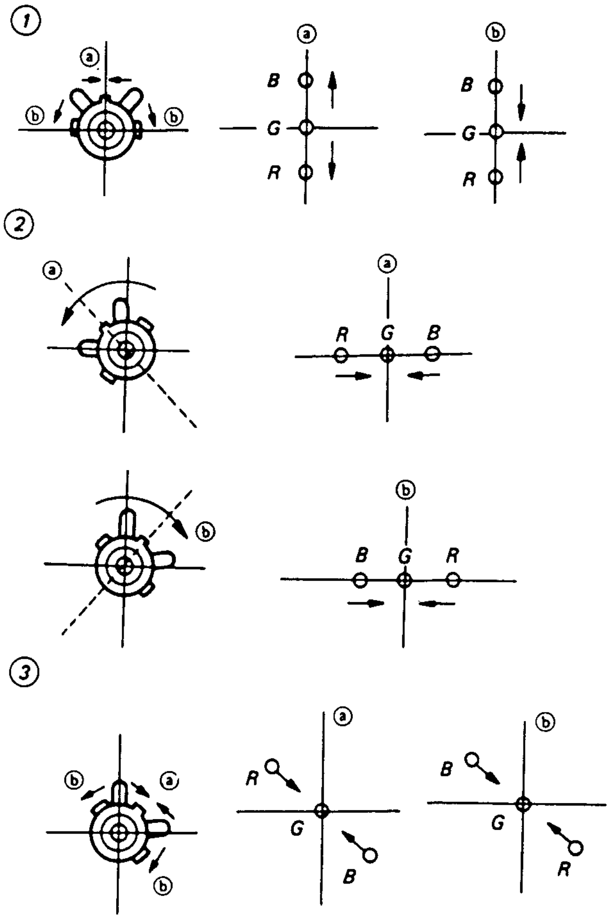
Fig. 1-5

1. Adjust H.STAT VR on the C Board to coincide red, green and blue dots on the center of screen (Horizontal movement)
2. Adjust V. STAT magnet to coincide red, green and blue dots on the center of screen (Vertical movement)
3. If the red, green and blue dots do not coincide on the center of screen with H. STAT VR, perform horizontal convergence adjustment using H. STAT VR and V. STAT magnet as shown below. (In this case, H. STAT VR and V. STAT magnet effect each other.)

- Tilt the V. STAT magnet and adjust static convergence to open or close the V. STAT magnet.

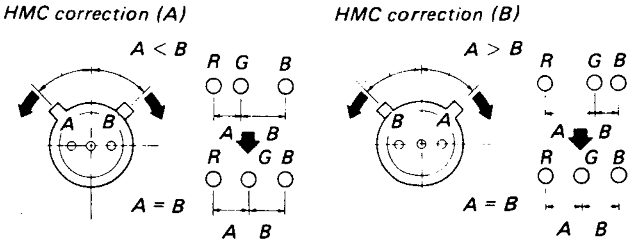


4. When the V. STAT magnet is moved in the direction of aroow ⓐ and ⓑ, Red, Green and Blue dots move as shown below.

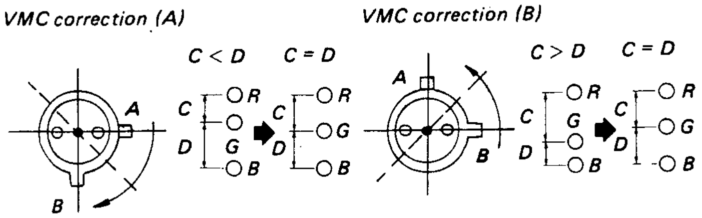

①
ⓐ
ⓑ
ⓑ
ⓐ
B
G
R
ⓑ
B
G
R
②
ⓐ
ⓐ
R G B
ⓑ
ⓑ
B G R
③
ⓑ
ⓐ
ⓑ
ⓐ
R
G
B
ⓑ
B
G
R

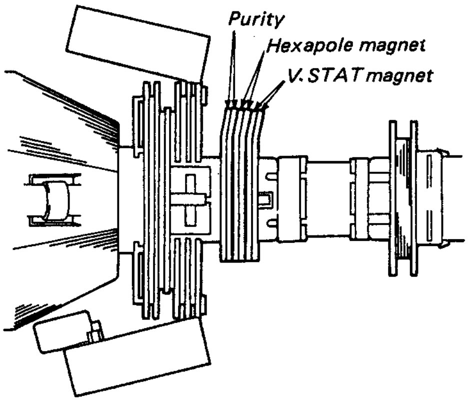
- **HMC and VMC correction for Hexapole Magnet.**

1. HMC (Horizontal. Mis. convergence) correction and motion of the Electron Beam with the Hexapole Magnet.


HMC correction (A)
A < B
R G B
A B
R G B
A = B
A B
HMC correction (B)
A > B
R G B
B A
A B
R G B
A = B
A B

2. VMC (Vertical, Mis, convergence) correction and motion of the Electron Beam with the Hexapole Magnet.


VMC correction (A)
VMC correction (B)
C < D
C = D
C > D
C = D
A
B
C
D
R
G
B


Purity
Hexapole magnet
V. STAT magnet

(2) Dynamic Convergence Adjustment

Preparation:

- Before starting, perform Horizontal and Vertical Static Convergence Adjustment.

1. Loosen deflection yoke screw.
2. Remove deflection yoke spacers.
3. Move the deflection yoke for best convergence as shown in Fig. 1-6.
4. Tighten the deflection yoke screw.
5. Install the deflection yoke spacers.

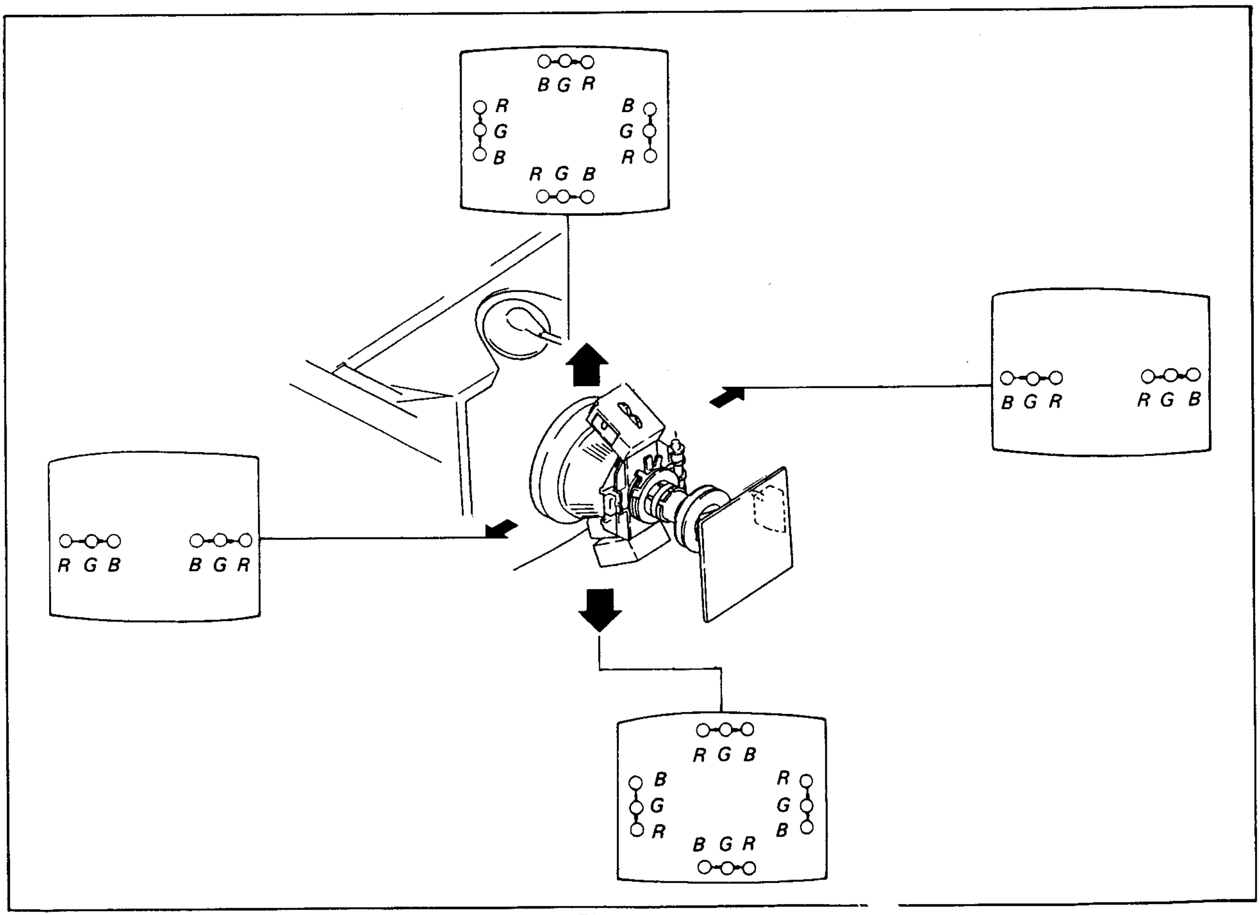
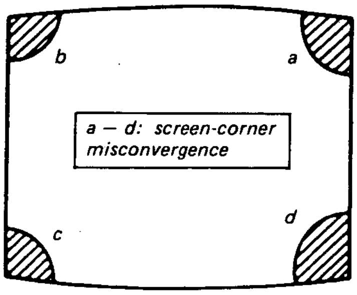
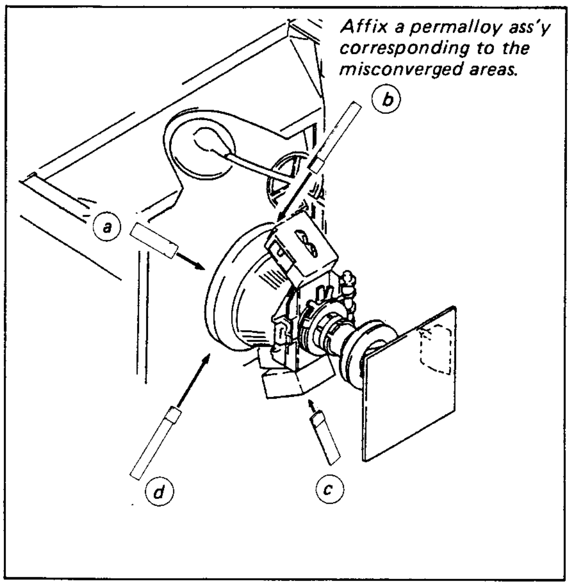
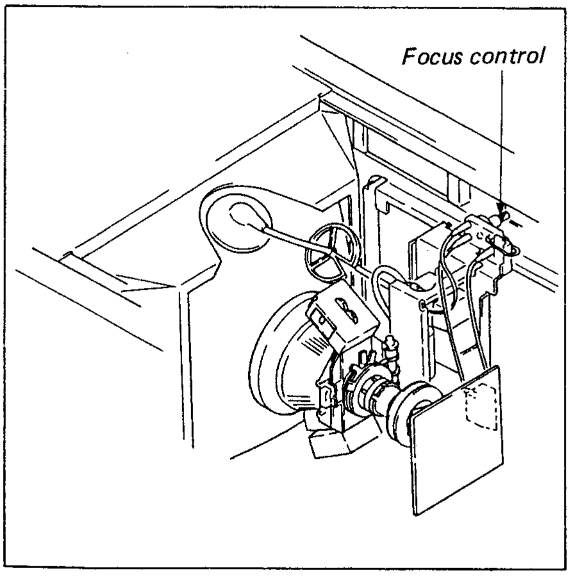

B G R
R G B
R G B
B G R
B G R
R G B
R G B
B G R
R G B
B G R

Fig. 1-6

(3) Screen-corner Convergence


b
a
a – d: screen-corner misconvergence
c
d


Affix a permalloy ass'y corresponding to the misconverged areas.
ⓑ
ⓐ
ⓓ
ⓒ


Focus control

[CONVERGENCE PROCESS]

1. UNDER SCAN switch ························· NOR (⊓)
2. Adjust the vertical static convergence with RV20 (X.S) at the sub control panel (DA board) as shown in left of Fig. 1-7.
3. Adjust the horizontal static convergence with RV17 (Y.S) at the sub control panel (DA board) as shown in right of Fig. 1-7.

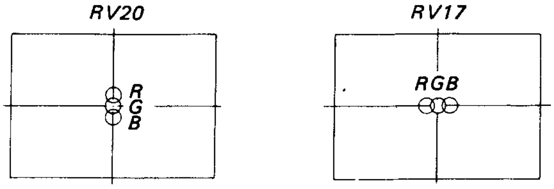

RV20
R
G
B
RV17
RGB

Fig. 1-7

4. Adjust the vertical convergence with RV18 (X. C. T) at the sub control panel (DA board) as shown in left upper corner of Fig. 1-8.
5. Adjust the vertical convergence with RV19 (X. C. B) at the sub control panel (DA board) as shown in left lower corner of Fig. 1-8.

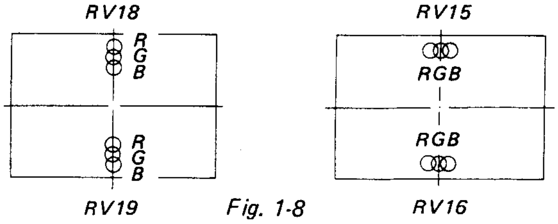

RV18
R
G
B
RV15
RGB
R
G
B
RGB
RV19
RV16

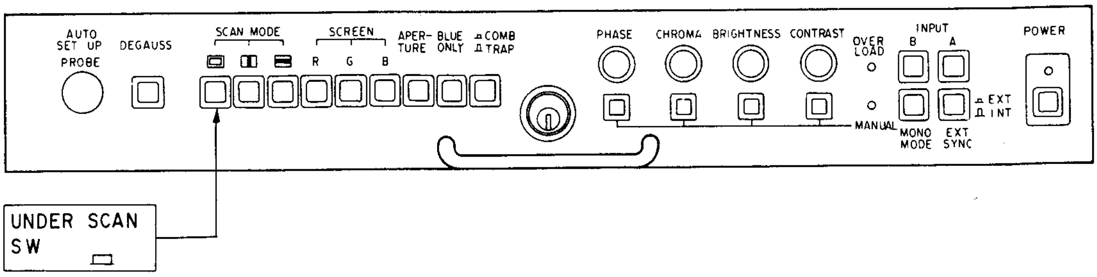
Fig. 1-8

6. Adjust the horizontal convergence with RV15 (Y.C.T) at the sub control panel (DA board) as shown in right upper corner of Fig. 1-8.
7. Adjust the horizontal convergence with RV16 (Y.C.B) at the sub control panel (DA board) as shown in right upper corner of Fig. 1-8.

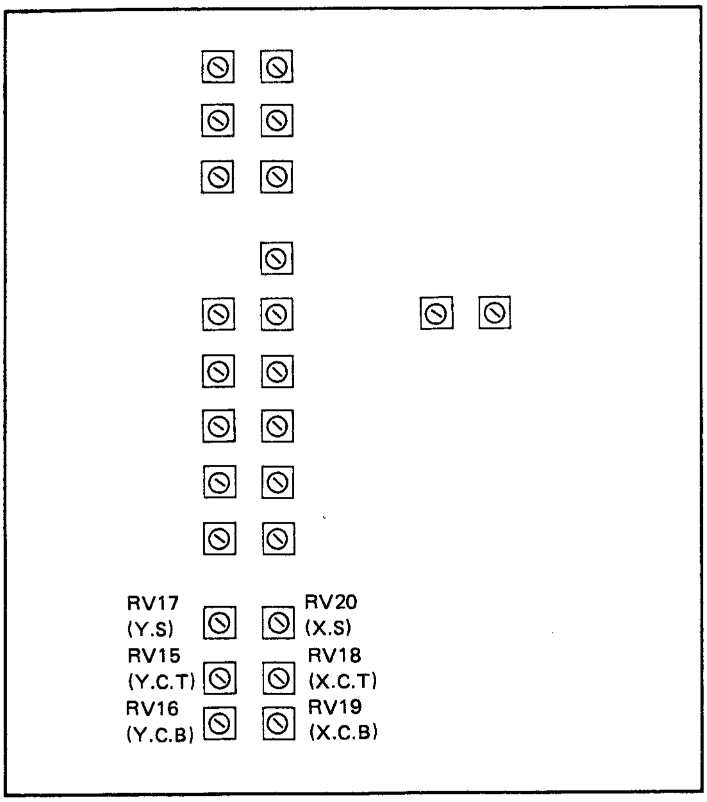
Focus adjustment

1. Input a dot or cross-hatch signals.
2. Adjust the FOCUS control for best focus in the central portion of the screen.

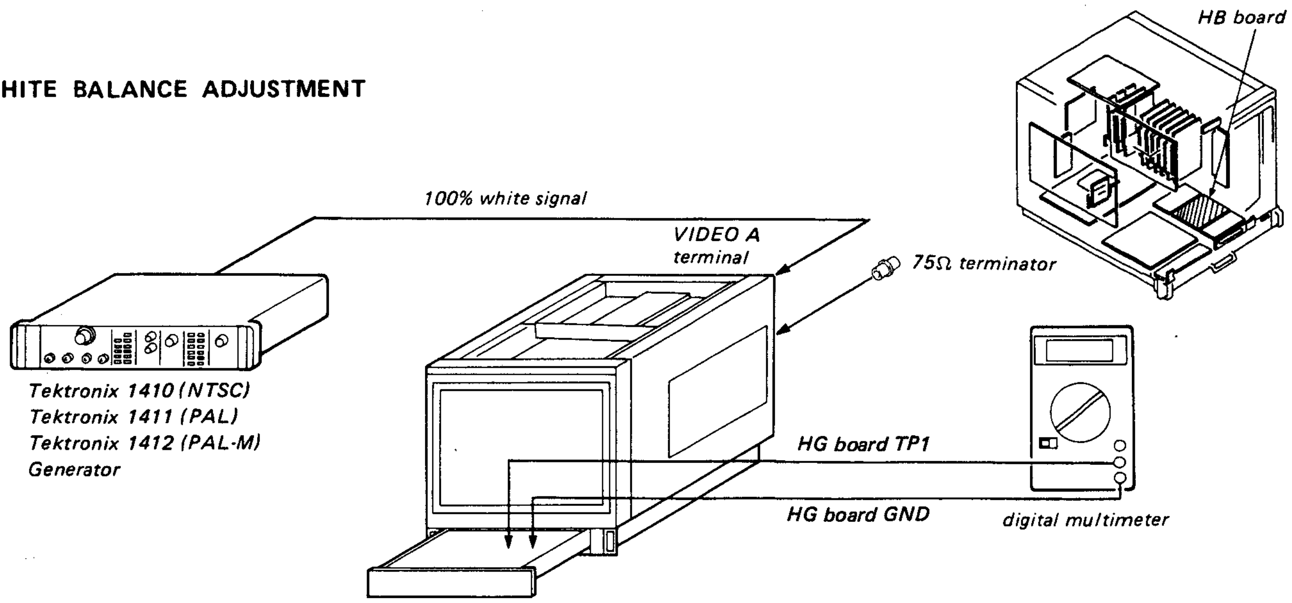
FRONT PANEL


AUTO SET UP PROBE
DEGAUSS
SCAN MODE
SCREEN
R
G
B
APER-TURE
BLUE ONLY
⎍ COMB
⎍ TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
MANUAL
INPUT
B
A
⎍ EXT
⎍ INT
MONO MODE
EXT SYNC
POWER
UNDER SCAN SW

DA board

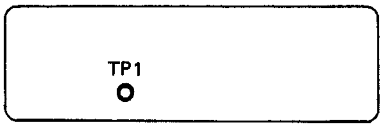

RV17 (Y.S)
RV20 (X.S)
RV15 (Y.C.T)
RV18 (X.C.T)
RV16 (Y.C.B)
RV19 (X.C.B)

WHITE BALANCE ADJUSTMENT

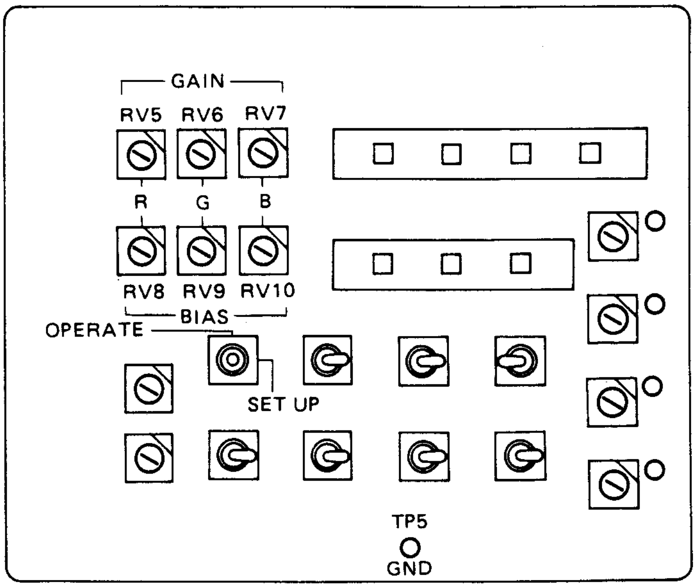

HB board
100% white signal
VIDEO A terminal
75Ω terminator
Tektronix 1410 (NTSC)
Tektronix 1411 (PAL)
Tektronix 1412 (PAL-M)
Generator
HG board TP1
HG board GND
digital multimeter

1. Input 100% white signal to VIDEO A connector.
2. WHITE/OPERATE/SET UP switch . . . . SET UP.
3. Connect digital multimeter between the TP1 and GND on the HG board.
4. BRIGHTNESS MANUAL switch . . . . . MANUAL. (▭)
5. Adjust with BRIGHTNESS control so that the voltage of TP1 becomes –0.7 Vdc.
6. Turn BIAS controls (RV8:Red,RV9:Green,RV10:Blue)on the HB board to adjust the BRIGHTNESS to 0.5NIT and white balance using COLOR ANALYZER and check 0.5NIT by LUMINANCE METER.
7. BRIGHTNESS MANUAL switch . . . . PREET (⊓)
8. WHITE/OPERATE/SET UP switch . . . . OPERATE.
9. Turn GAIN controls (RV5: Red,RV6: Green, RV7:Blue) on the HB board to adjust the BRIGHTNESS at HIGH LIGHT to 103 NIT and white balance using COLOR ANALYZER and check 103 NIT by LUMINANCE METER.
10. Repeat procedure steps 4 to 9 if necessary.

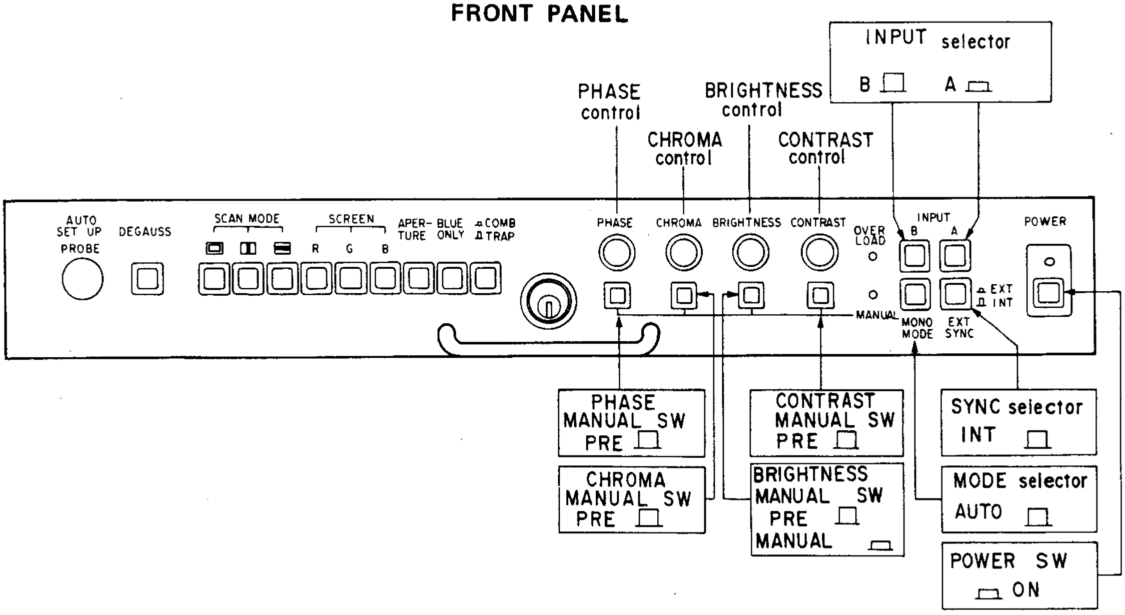
HG board



HB board


GAIN
RV5 RV6 RV7
R G B
RV8 RV9 RV10
BIAS
OPERATE
SET UP
TP5
GND

FRONT PANEL


INPUT selector
B ⊓ A ▭
PHASE control
BRIGHTNESS control
CHROMA control
CONTRAST control
AUTO SET UP PROBE
DEGAUSS
SCAN MODE
SCREEN
R G B
APER-TURE
BLUE ONLY
COMB TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
INPUT
B A
POWER
EXT INT
MANUAL
MONO MODE
EXT SYNC
PHASE MANUAL SW PRE ⊓
CONTRAST MANUAL SW PRE ⊓
SYNC selector INT ⊓
CHROMA MANUAL SW PRE ⊓
BRIGHTNESS MANUAL SW PRE ⊓ MANUAL ▭
MODE selector AUTO ⊓
POWER SW ▭ ON

4-6. SAFETY RELATED ADJUSTMENTS

+B PROTECTOR (◪ R52, R53)

When replacing the following components (marked ◪ on the schematic diagram), make this confirmation.

◪ GA Board ············Q13, Q14, R52, R53
GB Board ············Q3, Q4, Q5, D5, D6, D7, D8, R4, R5, R19, R20, R21, R22

It is necessary to use a digital multimeter for this confirmation.

Connect a digital multimeter to TP2and TP3 (GND) on GA Board.

1. Receive a color bar signal and set CONTRAST and BRIGHTNESS controls to preset position. (manual button is out ⊓)
2. Short-circuit R55 on GA board.
3. Connect a 100 kΩ variable resistor between TP4 and TP3 (GND) on GA board.
4. Turn down the 100 kΩ variable resistor gradually from maximum to minimum and confirm that voltage at TP2 drops abruptly to 0V when the digital multimeter reading reaches 199.0 ± 17.0V.
5. If step 4 isn't satisfied, select resistance values of R52 and R53 which satisfy the specifications.
6. Restore these to their original states and confirm that the voltage at TP2 is 150.0 ± 1.0V.

+B MAX CONFIRMATION (◪ R67, R68)

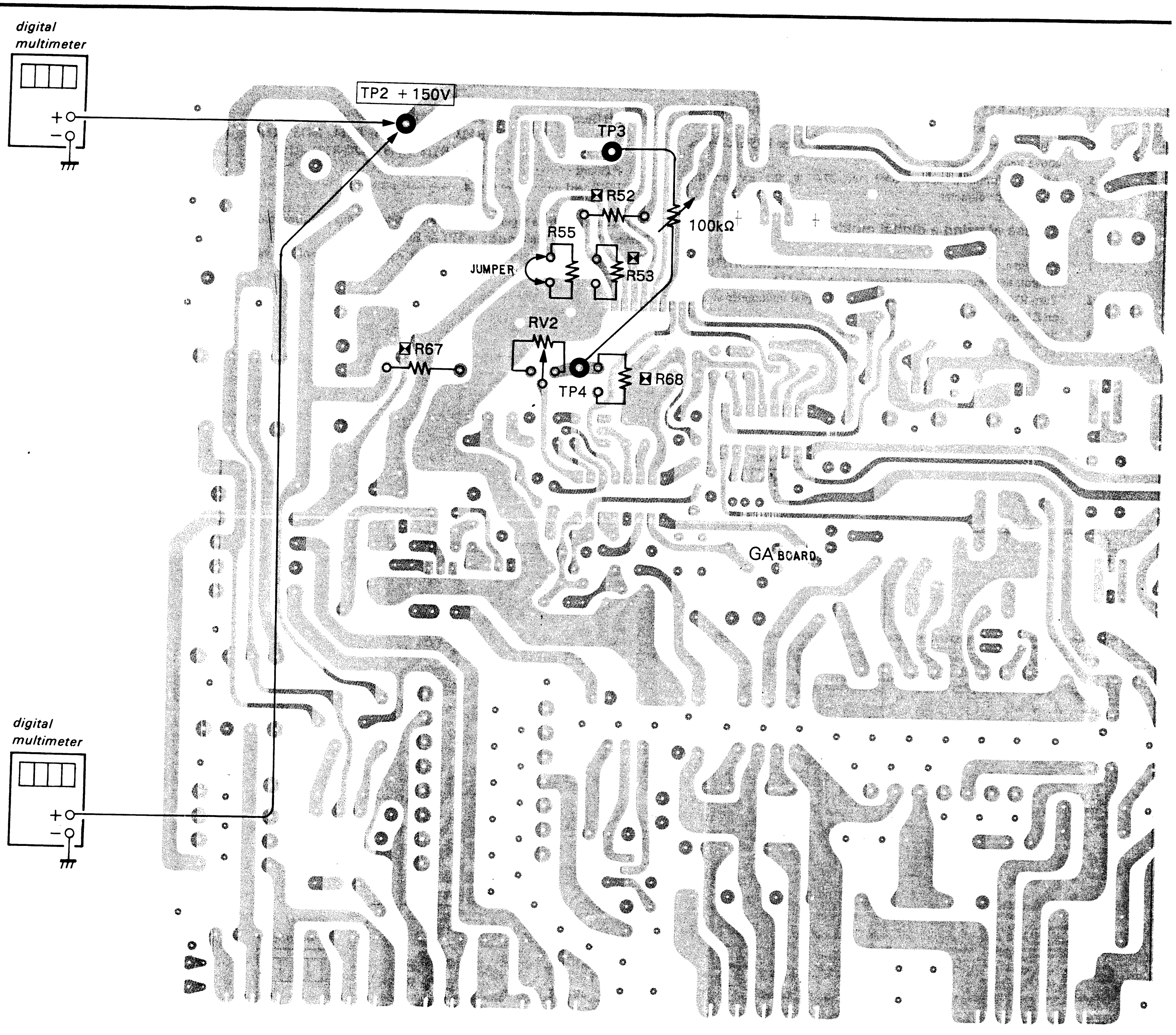
When replacing the following components (marked ◪ on the schematic diagram), make this confirmation.

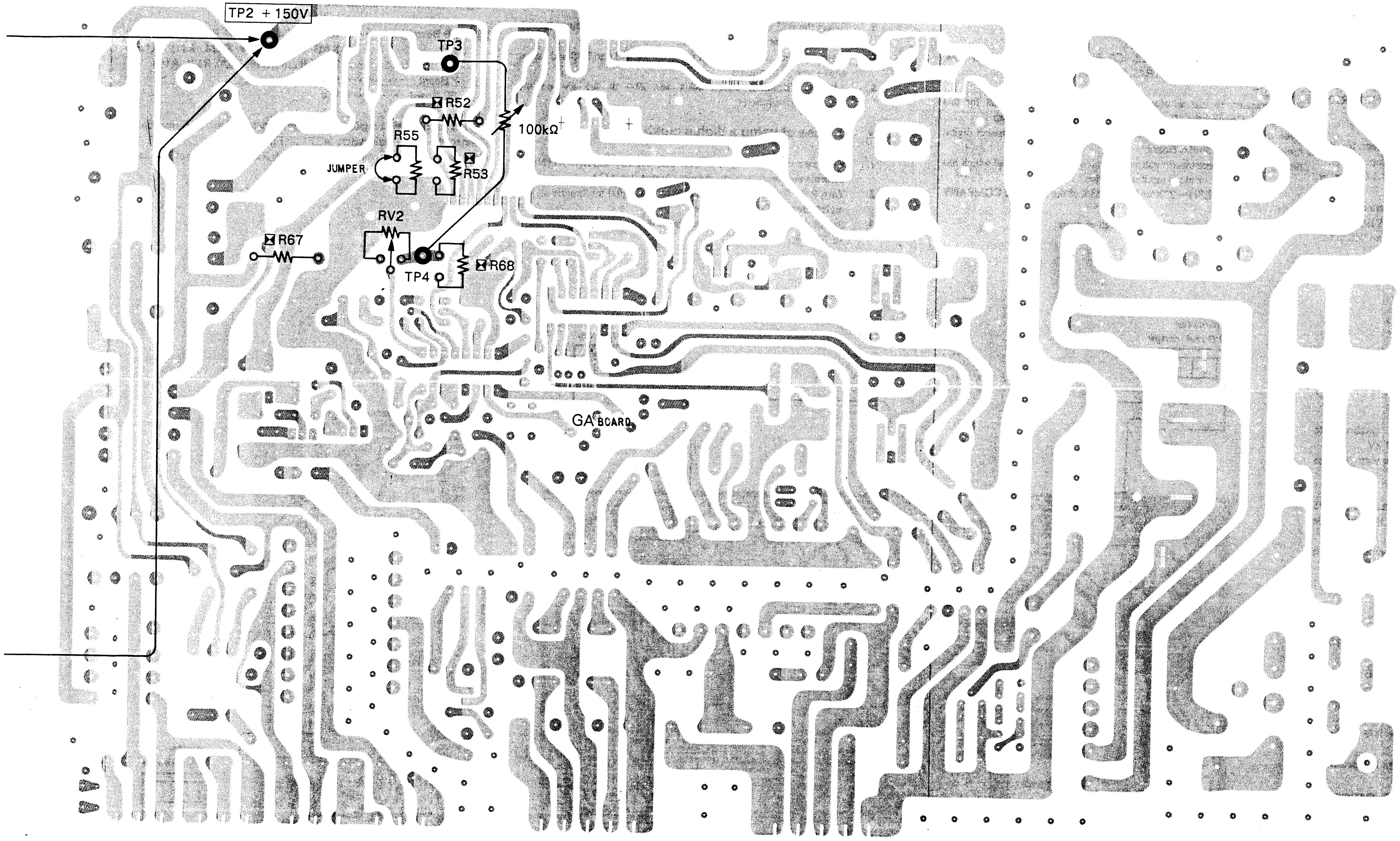
◪ GA Board ····················· IC3, C59, R67, R68, R78, RV2

It is necessary to use a digital multimeter for this confirmation.

Connect a digital multimeter to TP2 and TP3 (GND) on GA Board.

1. Receive a color bar signal and set CONTRAST and BRIGHTNESS controls to preset position. (manual button is out ⊓)
2. Confirm that the reading on the digital multimeter is +165.0V ± 13.0V when RV2 variable resistor is turned to fully clockwise.
3. If the specifications are not met, select resistance values for R67 and R68 which satisfy the specifications.
4. After confirmation, make the reading on the digital multimeter into 150.0V ± 1.0V by adjusting RV2 on GA Board.




TP2 +150V
TP3
R52
100kΩ
R55
JUMPER
R53
RV2
R67
TP4
R68
GA BOARD

HIGH VOLTAGE HOLD DOWN ADJUSTMENT AND CONFIRMATION

(☒ R106, R108)

When replacing the following components (marked ◪ on the schematic diagram), make this adjustment.

◪ HVR
◪ EB Board ············IC4, D24, D25, D27, R89, R90, R102, R103, R104, R105, R106, R107, R108, R111, R152

It is necessary to use an electrostatic voltmeter or equivalent for this adjustment. Connect the electrostatic voltmeter to the anode cap.
Connect the DC current meter (3 mA range, accuracy of 1.0 class or more)
Even through an electrostatic voltmeter may not be used, connect digital multimeters to TP2 on EB Board. TP6 and TP5 (GND) on EA Board.

Note: Use an electrostatic voltmeter which is calibrated, and which has $2 \times 10^9 \Omega$ or more input impedance.
example: ESH– 27X or ESH– 23X of the SINGER COMPANY

Use a digital multimeter which has 4 digit or more.

• In case of using electrostatic voltmeter

1. Receive a color bar signal and set CONTRAST and BRIGHTNESS controls to preset position. (Manual button is OUT ⎍)
2. Connect 200 kΩ variable resistor with R75 in parallel on EA Board.
3. Connect an electrostatic voltmeter to the CRT anode.
4. Turn down the variable resistor gradually from maximum to minimum until the anode voltage becomes 29.0 ± 0.1 kV.
5. Select the R106 or R108 resistance so that the anode voltage drops abruptly at 29.0 ± 0.1 kV.
6. Solder the selected resistor to R106 or R108.
7. Turn power on, turn down the variable resistor attached to R75 gradually from maximum to minimum and confirm that the anode voltage drops abruptly at 29.0 ± 0.5 kV.
8. Remove the variable resistor and confirm that the anode voltage is 27.0 ± 0.1 kV.
9. Detach the electrostatic voltmeter from the anode.

• In case of using electrostatic voltmeter

1. Receive a color bar signal and set CONTRAST and BRIGHTNESS controls to preset position. (Manual button is OUT ⎍)
2. Connect the digital multimeter between TP2 on the EB board and GND.
3. Select the R106 or R108 resistance so that the digital multimeter reading becomes 16.89 ± 0.1V.
4. Connect the 200 k Ω variable resistor in parallel to R75 on the EA board.
5. Connect the digital multimeter between TP6 on the EA board and GND.
6. Turn down the variable resistor gradually from maximum to minimum and confirm that the picture disappears when voltage at TP2 goes beyond 16.89 ± 0.1V.

HIGH VOLTAGE REGULATOR CONFIRMATION

(☒ R73, R75)

When replacing the following components (marked ◪ on the schematic diagram), make this adjustment.

◪ HVR
◪ EA Board ············IC2, IC3, R61, R62, R71, R72, R73, R74, R75, R88, RV1

It is necessary to use an electrostatic voltmeter or equivalent for this adjustment. Connect the electrostatic voltmeter to the anode cap.
Even though an electrostatic voltmeter may not be used, connect digital multimeter to TP6 on EA Board.

Note: Use an electrostatic voltmeter which is calibrated, and which has $2 \times 10^9 \Omega$ or more input impedance.
example: ESH– 27X or ESH– 23X of the SIGNER COMPANY

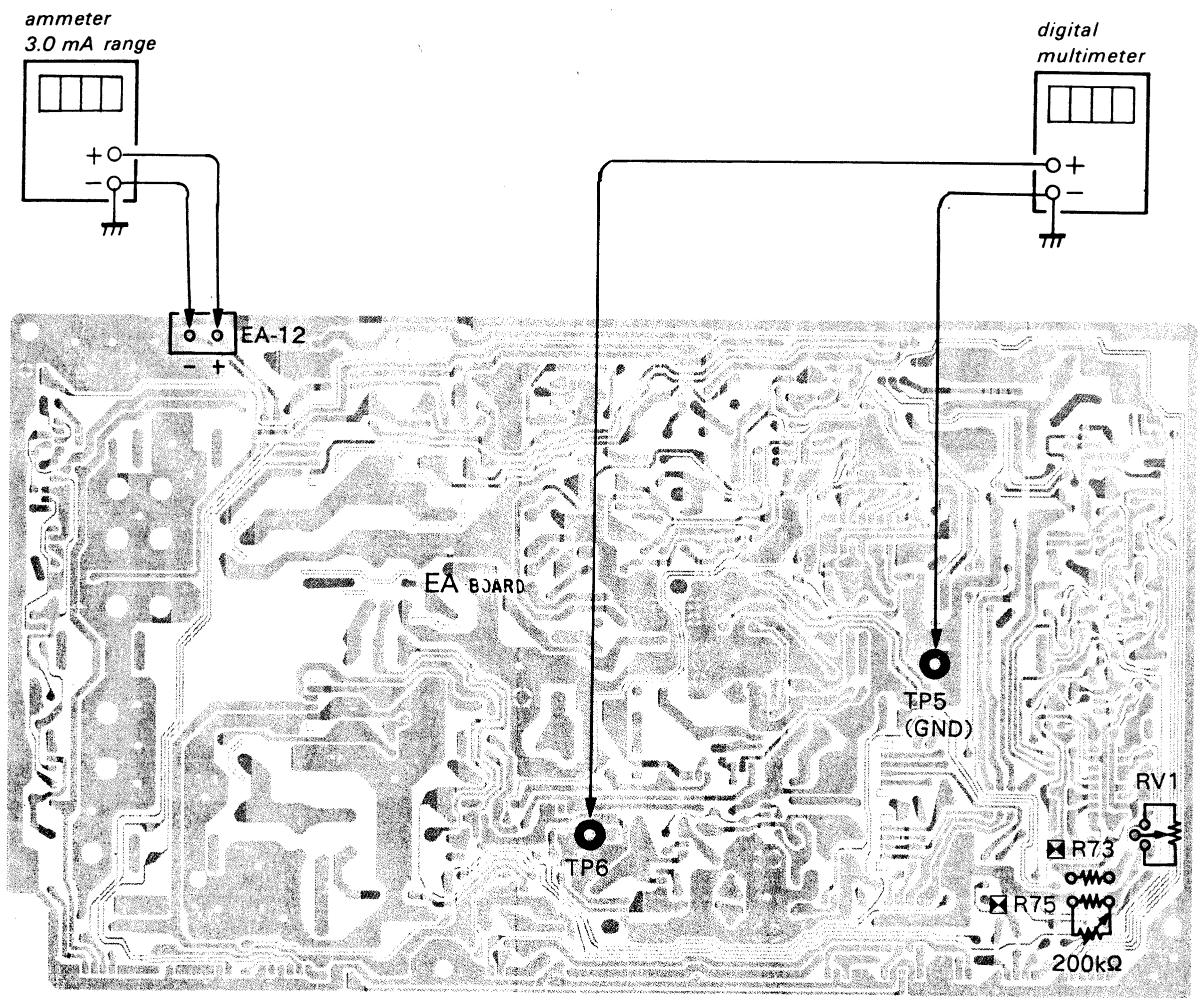
Use a digital multimeter which has 4 digit or more.

• In case of using electrostatic voltmeter

1. Receive a color bar signal and set CONTRAST and BRIGHTNESS controls to preset position. (Manual button is out ⎍)
2. Turn RV1 on EA Board for a maximum reading on the electrostatic voltmeter. (Fully clockwise)
3. Select the R73 and R75 resistance so that the electrostatic voltmeter reading becomes 27.35 ± 0.15 kV.
4. If step 3 is not satisfied, select the value of R73 and R75 and repeat above steps 2 through 3 .
5. After confirmation adjust RV1 for 27.0 ± 0.1 kV on the electrostatic voltmeter.

• In case of using a digital multimeter

1. Receive a color bar signal and set CONTRAST and BRIGHTNESS controls to preset position. (Manual button is out ⎍)
2. Turn RV1 for a maximum reading on the digital multimeter at TP6 on EA Board. (Fully clockwise)
3. Select the R73 and R75 resistance so that voltage at TP6 becomes 15.70 ± 0.1V.



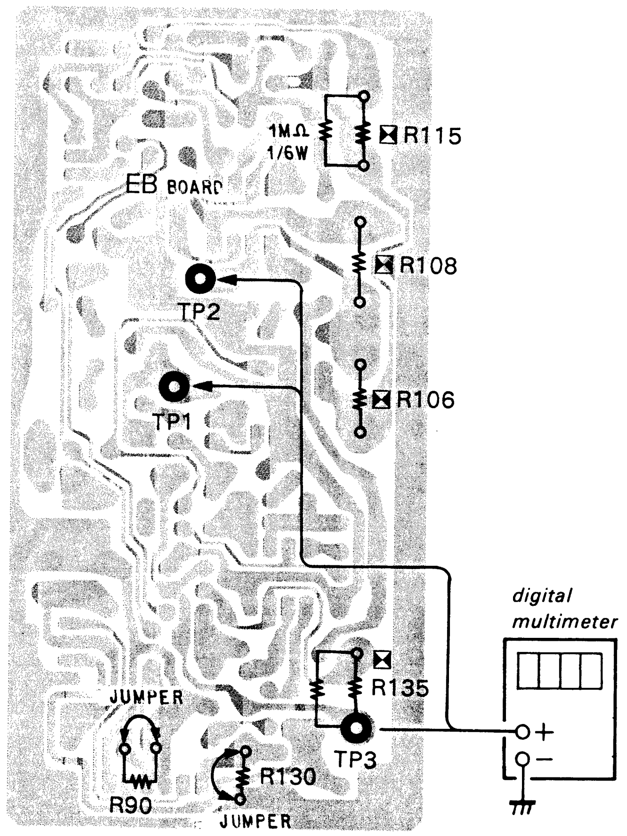
BEAM CURRENT PROTECTOR 1 CONFIRMATION

(☒ R115)

When replacing the following components (marked ◪ on the schematic diagram), make this confirmation.

◪ EB Board ············IC4, D24, D26, D27, R89, R90, R102, R103, R112, R113, R114, R115, R116, R117, R118, R119, R120, R121, R153
P Board ··············FBT
EB Board ············IC4

It is necessary to use a regulated digital multimeter for this confirmation.
Connect the digital multimeters to TP1 on EB Board
Connect the current meter to EA-12. (3 mA Range, accuracy of 1.0 class or more)



1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

BEA

(☒ R

When
diagra

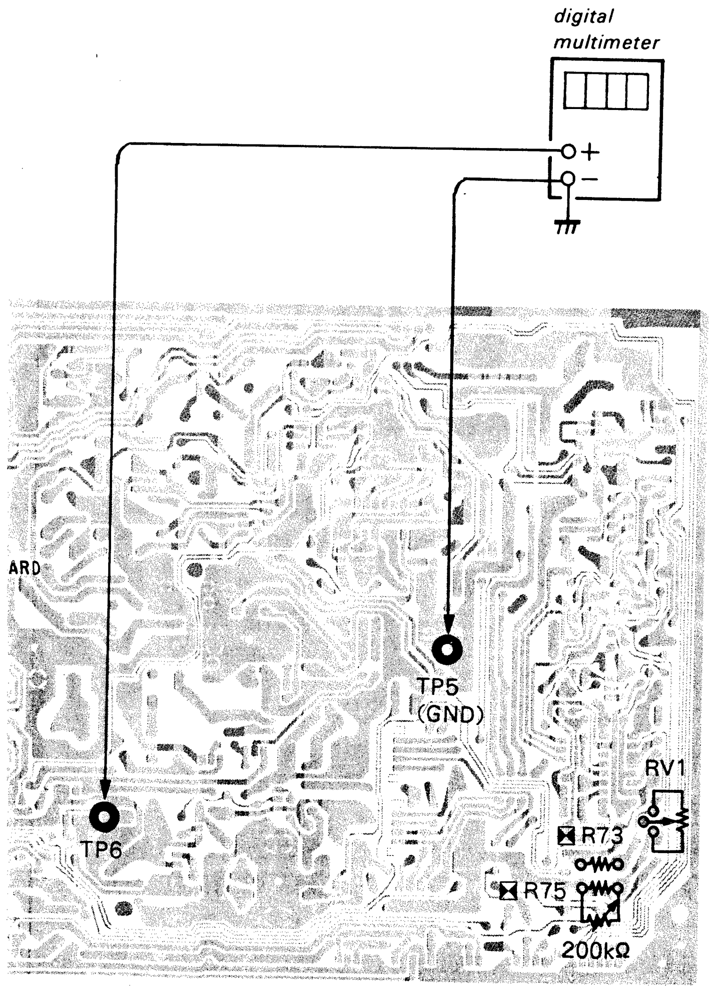
◪

- **In case of using electrostatic voltmeter**

1. Receive a color bar signal and set CONTRAST and BRIGHTNESS controls to preset position. (Manual button is out ⊓)
2. Turn RV1 on EA Board for a maximum reading on the electrostatic voltmeter. (Fully clockwise)
3. Select the R73 and R75 resistance so that the electrostatic voltmeter reading becomes 27.35 ± 0.15 kV.
4. If step 3 is not satisfied, select the value of R73 and R75 and repeat above steps 2 through 3 .
5. After confirmation adjust RV1 for 27.0 ± 0.1 kV on the electrostatic voltmeter.

- **In case of using a digital multimeter**

1. Receive a color bar signal and set CONTRAST and BRIGHTNESS controls to preset position. (Manual button is out ⊓)
2. Turn RV1 for a maximum reading on the digital multimeter at TP6 on EA Board. (Fully clockwise)
3. Select the R73 and R75 resistance so that voltage at TP6 becomes 15.70 ± 0.1V.



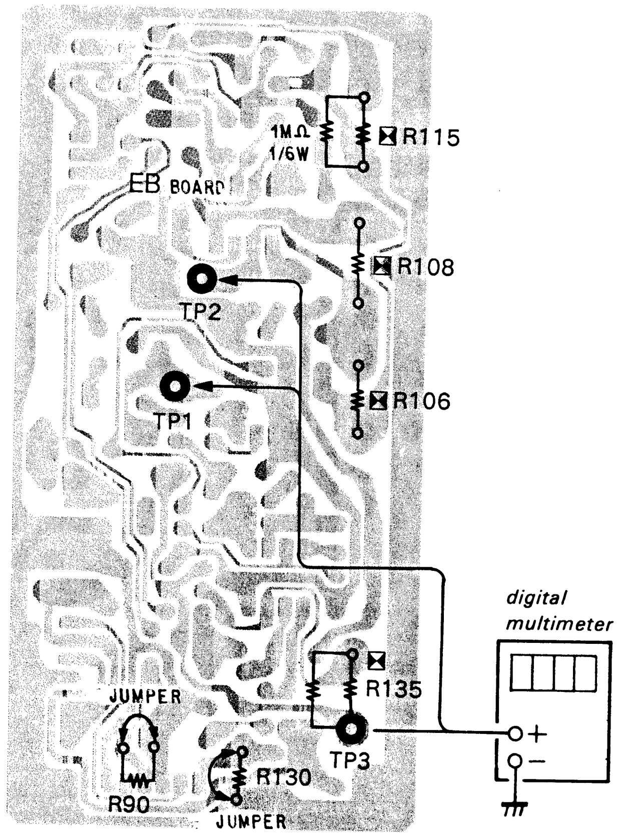
BEAM CURRENT PROTECTOR 1 CONFIRMATION

(☒ R115)

When replacing the following components (marked ◪ on the schematic diagram), make this confirmation.

◪ EB Board ···········IC4, D24, D26, D27, R89, R90, R102, R103, R112, R113, R114, R115, R116, R117, R118, R119, R120, R121, R153
P Board ·············FBT
EB Board ···········IC4

It is necessary to use a regulated digital multimeter for this confirmation.
Connect the digital multimeters to TP1 on EB Board
Connect the current meter to EA-12. (3 mA Range, accuracy of 1.0 class or more)



1. Receive a color bar signal.
2. Remove the EA-12 connector and connect the DC ammeter.
3. Connect the digital multimeter between TP1 on the EB board and GND.
4. Short-circuit C1 on the BI board.
5. Short-circuit R130 on the EB board.
6. Turn power on, read voltage at TP1, then proceed as follows:
   - If 32.5V or over, solder the 1 MΩ (1/6W) metal-film resistor to R115 on the EB board.
   - If less than 32.5V, open R115.
7. Turn the BRIGHTNESS and CONTRAST controls (MANUAL button is IN ▭) and confirm that the picture disappears when the DC ammeter reads 2.0 ± 0.4 mA.
8. If the condition in step 7 is not satisfied, select the R115 resistance accordingly.
9. Return the EA-12 connector, C1 on the BI board and R130 on the EB Board to their initial condition.
10. Set the BRIGHTNESS and CONTRAST controls to maximum and confirm that the OVERLOAD lamp lights.

BEAM CURRENT PROTECTOR 2 CONFIRMATION

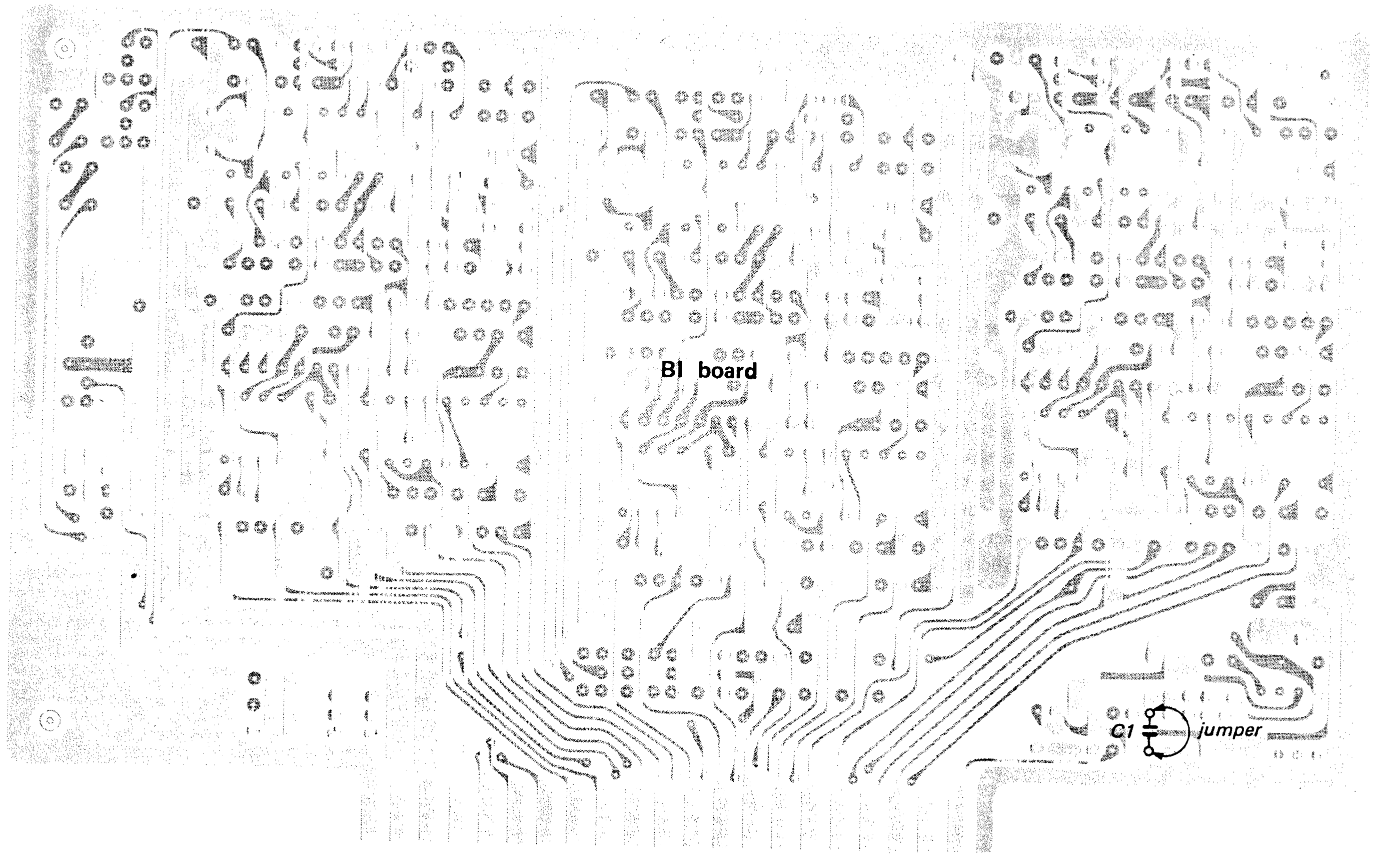
(☒ R135)

When replacing the following components (marked ◪ on the schematic diagram), make this confirmation.

◪ EB Board ···········IC6, D29, D51, R122, R123, R124, R130, R131, R132, R133, R134, R135, R136, R137, R138, R140, R141
P Board ·············FBT

It is necessary to use a regulated digital multimeter for this confirmation.
Connect the digital multimeters to TP3 on EB Board.
Connect the current meter to EA-12 (3 mA Range accuracy of 1.0 class or more)

1. Receive a color bar signal.
2. Remove the EA-12 connector and connect the DC ammeter.
3. Connect the digital multimeter between TP3 on the EB board and GND.
4. Short-circuit C1 on the BI board.
5. Short-circuit R90 on the EB board.
6. Turn power on, read voltage at TP3, then proceed as follows:
   - If 32.5V or over, solder the 1 MΩ (1/6W) metal-film resistor to R135 on the EB board.
   - If less than 32.5V, open R135.
7. Turn the BRIGHTNESS and CONTRAST controls (MANUAL button is in ▭) and confirm that the picture disappears when the DC ammeter reads 2.0 ± 0.4 mA.
8. If the condition in step 7 is not satisfied, select R135 resistance accordingly.
9. Return the EA-12 connector, C1 on the BI board and R90 on the EB board to their initial condition.
10. Set the BRIGHTNESS and CONTRAST controls to maximum and confirm that the OVERLOAD lamp lights.



4-7. CIRCUIT ADJUSTMENTS

- To make the following adjustments, unless otherwise specified, the controls knobs and switches shall be preset as described below.

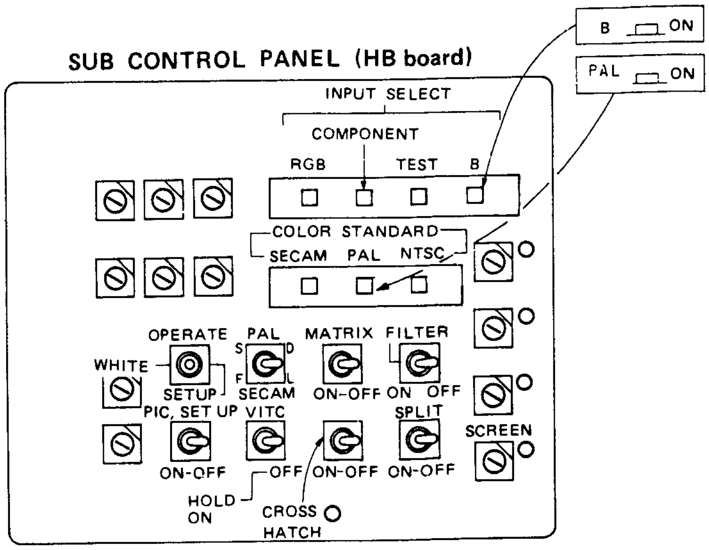
FRONT PANEL

1.	INPUT selector	A	HC board
2.	SYNC selector	INT	
3.	MODE selector	AUTO	
4.	CONTRAST MANUAL switch	PRESET	HG board
5.	BRIGHTNESS MANUAL switch	PRESET	
6.	CHROMA MANUAL switch	PRESET	
7.	PHASE MANUAL switch	PRESET	
8.	SCAN MODE switch		HA board
	▣ UNDER SCAN	NOR	
	◫ H. DELAY	NOR	
	⊟ V. DELAY	NOR	
9.	SCREEN switch (R)	NOR	
10.	SCREEN switch (G)	NOR	
11.	SCREEN switch (B)	NOR	
12.	APT switch	NOR	
13.	BLUE ONLY switch	NOR	
14.	COMB/TRAP filter selector	TRAP	

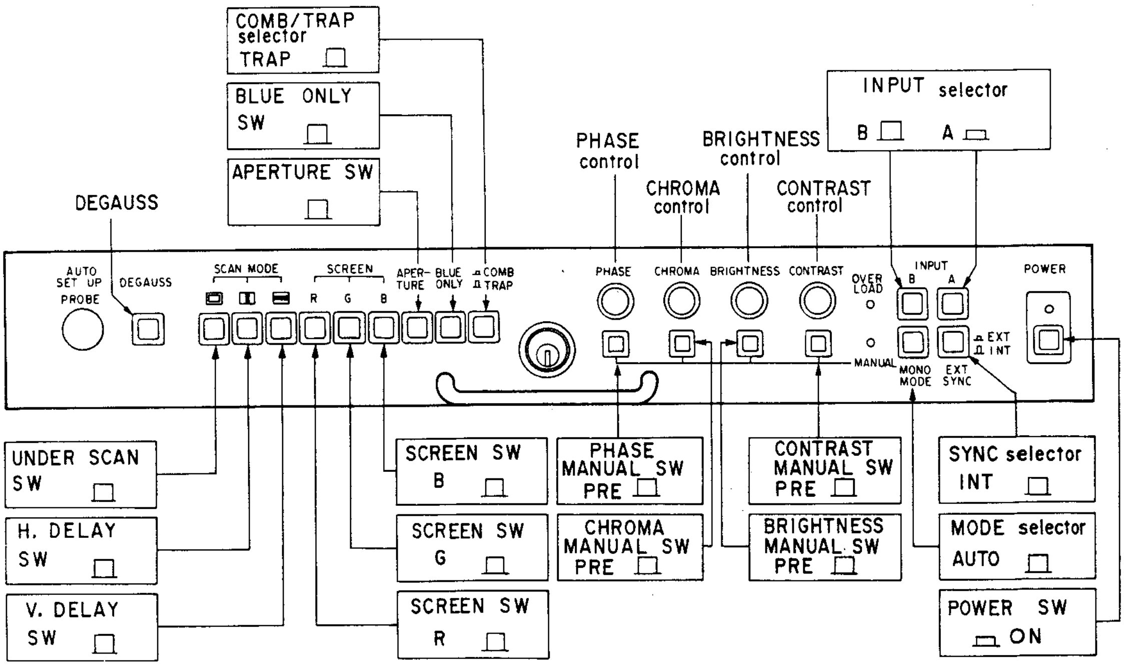
SUB CONTROL PANEL

15.	INPUT SELECT buttons	B	HB board
16.	COLOR STANDARD buttons	PAL	
17.	FILTER switch	OFF	
18.	MATRIX switch	OFF	
19.	PAL/SECAM mode selector	D(L)	
20.	WHITE/OPERATE/SET UP selector	OPERATE	
21.	SPLIT SCREEN switch	OFF	
22.	CROSS HATCH switch	OFF	
23.	VITC switch	OFF	
24.	PIC. SET UP switch	OFF	
25.	AFC switch	2m sec	DA board

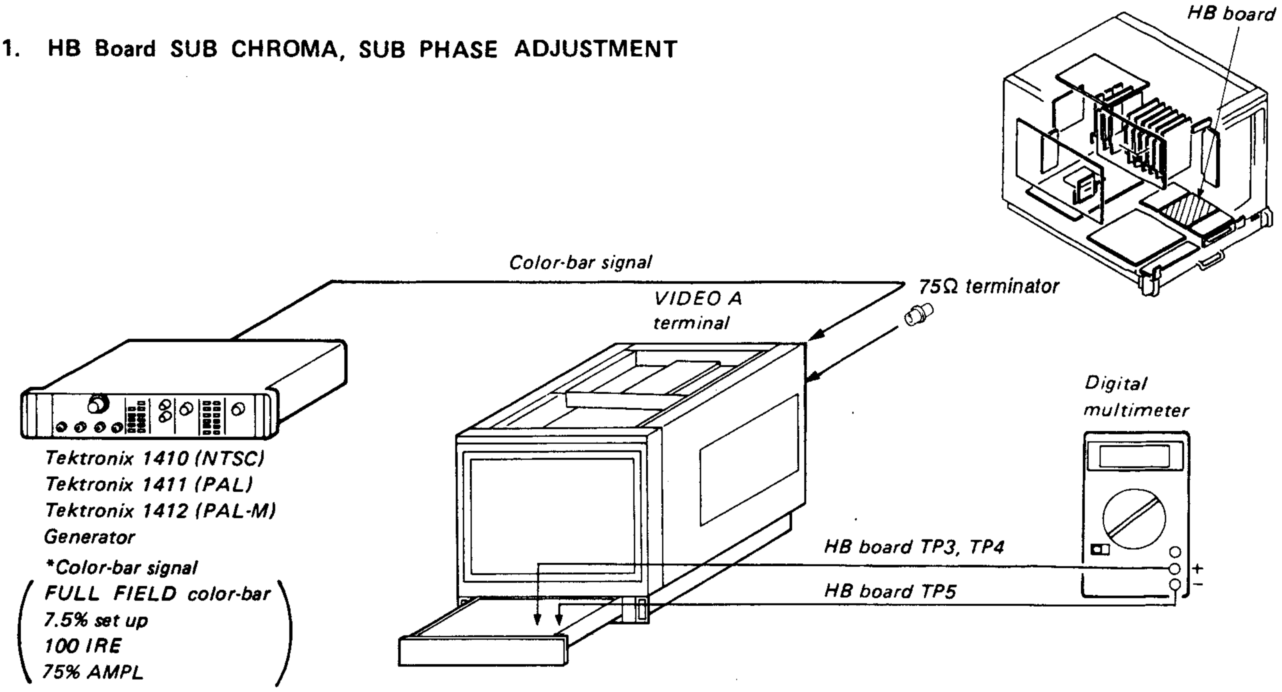
SUB CONTROL PANEL (HB board)


B ON
PAL ON
INPUT SELECT
COMPONENT
RGB
TEST
B
COLOR STANDARD
SECAM
PAL
NTSC
OPERATE
PAL
MATRIX
FILTER
WHITE
S
D
F
L
SETUP
SECAM
ON-OFF
ON
OFF
PIC. SET UP
VITC
SPLIT
SCREEN
ON-OFF
OFF
ON-OFF
ON-OFF
HOLD
ON
CROSS
HATCH

FRONT PANEL

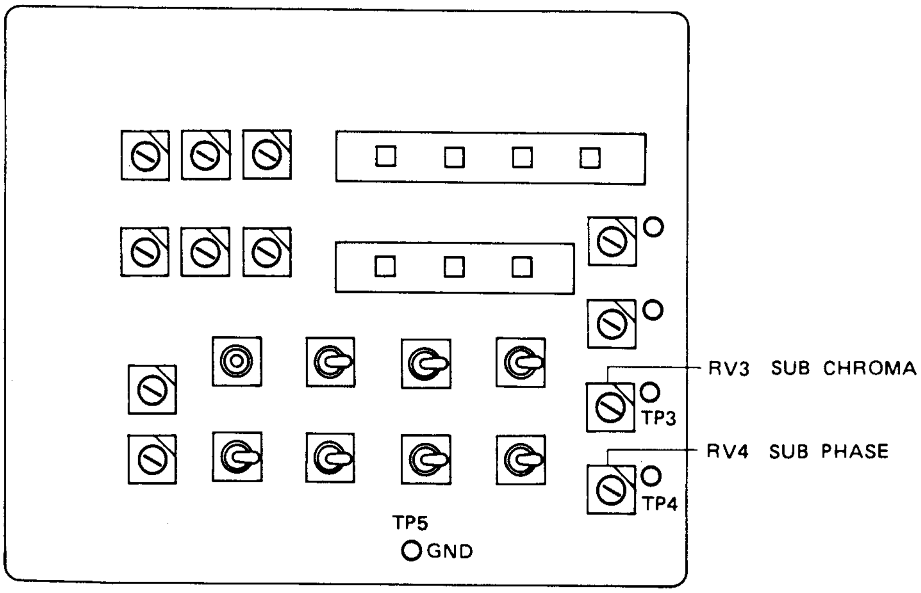

COMB/TRAP selector
TRAP
BLUE ONLY SW
APERTURE SW
DEGAUSS
PHASE control
BRIGHTNESS control
CHROMA control
CONTRAST control
INPUT selector
B
A
AUTO SET UP PROBE
DEGAUSS
SCAN MODE
SCREEN
R
G
B
APER-TURE
BLUE ONLY
COMB
TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
INPUT
B
A
POWER
EXT
INT
MANUAL
MONO MODE
EXT SYNC
UNDER SCAN SW
H. DELAY SW
V. DELAY SW
SCREEN SW B
SCREEN SW G
SCREEN SW R
PHASE MANUAL SW PRE
CHROMA MANUAL SW PRE
CONTRAST MANUAL SW PRE
BRIGHTNESS MANUAL SW PRE
SYNC selector INT
MODE selector AUTO
POWER SW ON

1. HB Board SUB CHROMA, SUB PHASE ADJUSTMENT

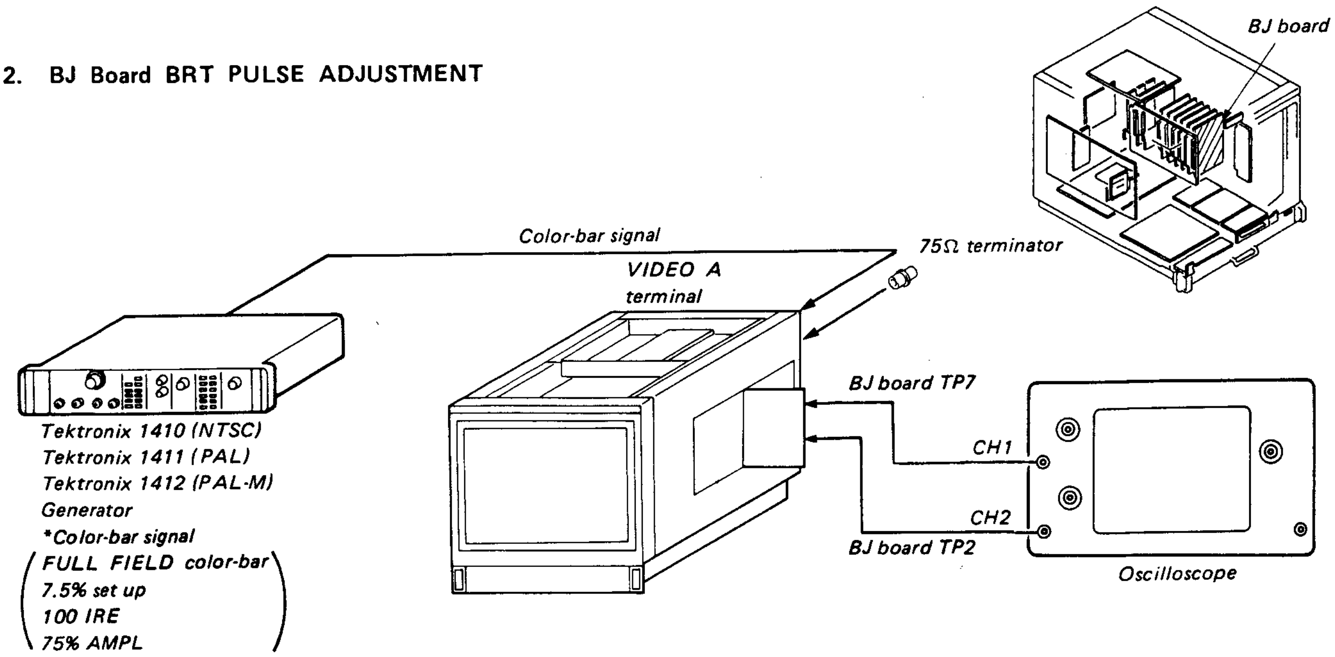

HB board
Color-bar signal
VIDEO A terminal
75Ω terminator
Digital multimeter
HB board TP3, TP4
HB board TP5
+
−
Tektronix 1410 (NTSC)
Tektronix 1411 (PAL)
Tektronix 1412 (PAL-M)
Generator
*Color-bar signal
FULL FIELD color-bar
7.5% set up
100 IRE
75% AMPL

1. Connect a digital multimeter to the TP3 of HB board and TP5 (ground).
2. Adjust to −5.5V DC with RV3. (SUB CHROMA)
3. Connect a digital multimeter to the TP4 of HB board and TP5.
4. Adjust to 0V DC with RV4. (SUB PHASE) of HB board.

HB board


RV3 SUB CHROMA
TP3
RV4 SUB PHASE
TP4
TP5
GND

2. BJ Board BRT PULSE ADJUSTMENT


BJ board
Color-bar signal
75Ω terminator
VIDEO A
terminal
BJ board TP7
CH1
CH2
BJ board TP2
Oscilloscope
Tektronix 1410 (NTSC)
Tektronix 1411 (PAL)
Tektronix 1412 (PAL-M)
Generator
*Color-bar signal
FULL FIELD color-bar
7.5% set up
100 IRE
75% AMPL

1. Input a color-bar signal to VIDEO A terminal of the set.
2. Connect an oscilloscope (CH1 probe) to the TP7 of BJ board and oscilloscope (CH2 probe) to the TP2 of BJ board.
3. Adjust RV7 to obtain the waveform on the oscilloscope as shown in Fig. 2-1.

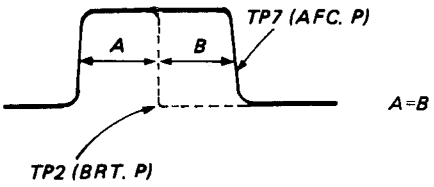
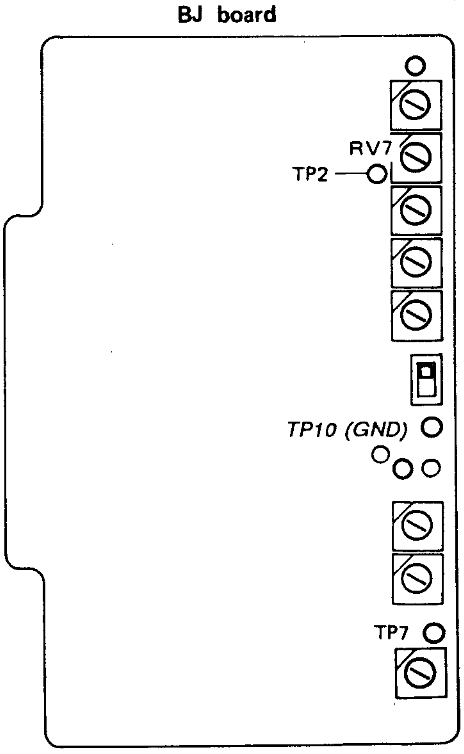
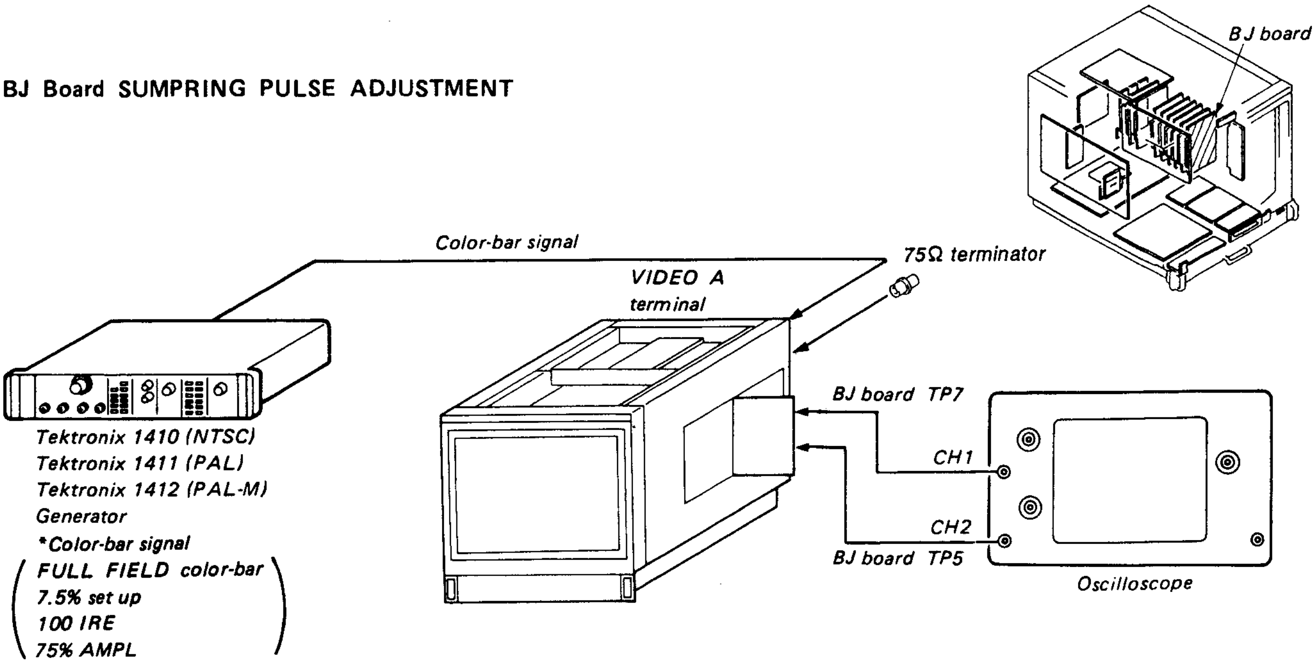

A
B
TP7 (AFC. P)
A=B
TP2 (BRT. P)

Fig. 2-1


BJ board
RV7
TP2
TP10 (GND)
TP7

BJ Board SUMPRING PULSE ADJUSTMENT


BJ board
Color-bar signal
VIDEO A terminal
75Ω terminator
BJ board TP7
CH1
CH2
BJ board TP5
Oscilloscope
Tektronix 1410 (NTSC)
Tektronix 1411 (PAL)
Tektronix 1412 (PAL-M)
Generator
*Color-bar signal
FULL FIELD color-bar
7.5% set up
100 IRE
75% AMPL

1. Input a color-bar signal to VIDEO A terminal of the set.
2. Connect an osilloscope (CH 1 probe) to the TP7 of BJ board and Connect an oscilloscope (CH 2 probe) to the TP5 of BJ board.
3. Adjust RV5 to obtain the waveform on the oscilloscope as shown in Fig. 2-2.

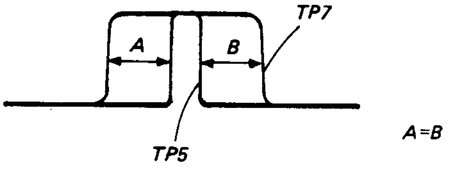
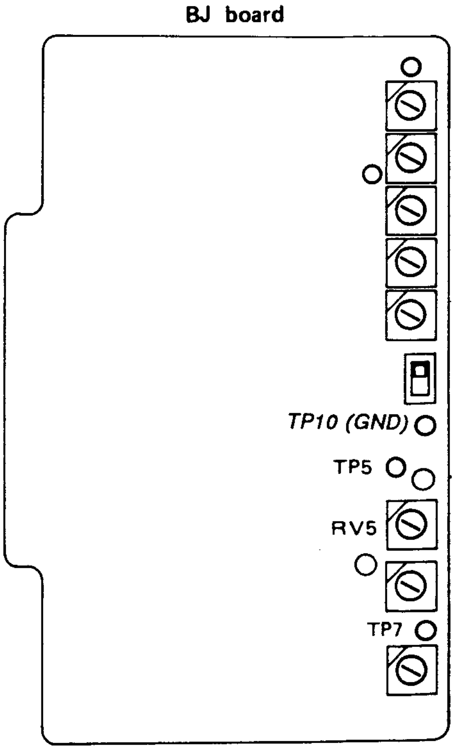
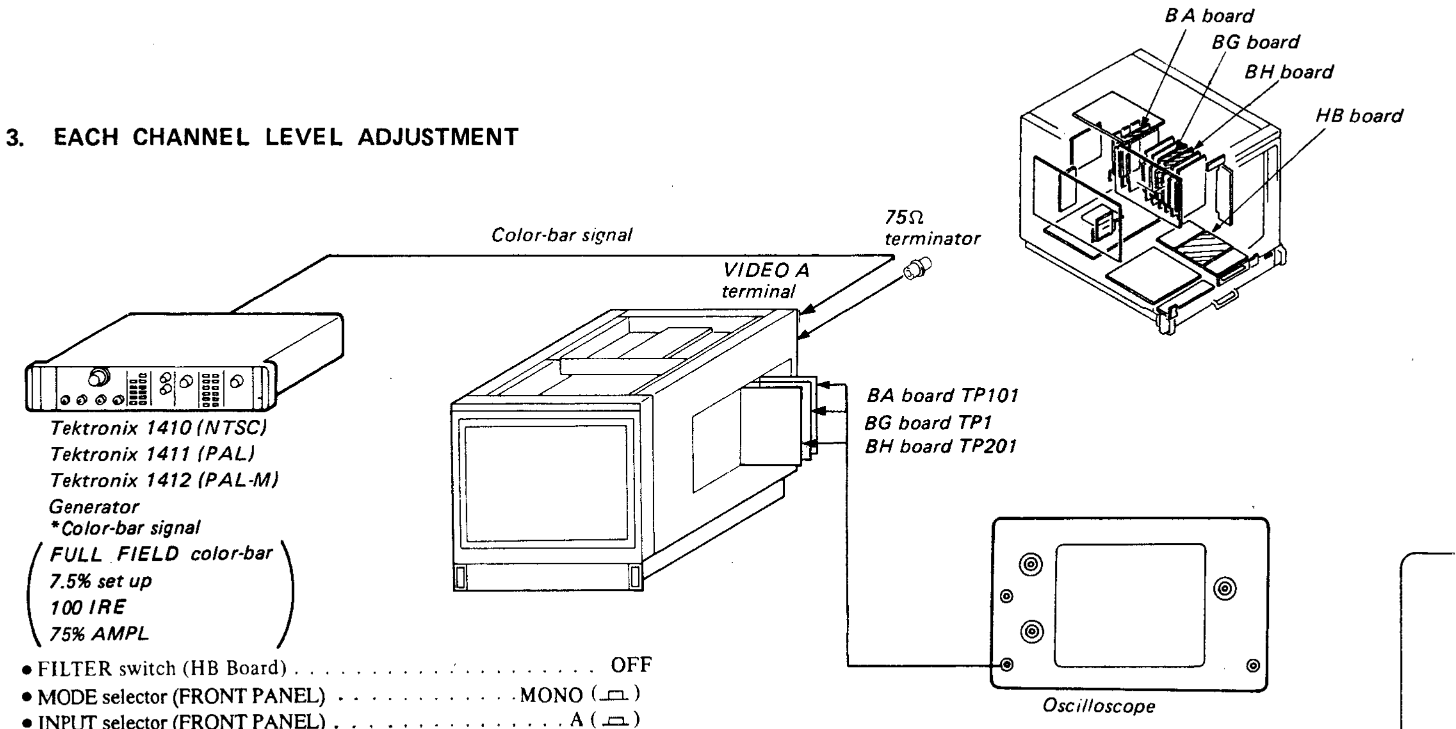

TP7
A
B
TP5
A=B

Fig. 2-2


BJ board
TP10 (GND)
TP5
RV5
TP7

3. EACH CHANNEL LEVEL ADJUSTMENT


B A board
BG board
BH board
HB board
Color-bar signal
75Ω terminator
VIDEO A terminal
BA board TP101
BG board TP1
BH board TP201
Tektronix 1410 (NTSC)
Tektronix 1411 (PAL)
Tektronix 1412 (PAL-M)
Generator
*Color-bar signal
FULL FIELD color-bar
7.5% set up
100 IRE
75% AMPL
Oscilloscope

- FILTER switch (HB Board) . . . . OFF
- MODE selector (FRONT PANEL) . . . . MONO (⊓)
- INPUT selector (FRONT PANEL) . . . . A (⊓)

BA board

1. Input a color-bar signal to VIDEO A terminal to the set.
2. Connect an oscilloscope to the TP101 of BA board.
3. Adjust to 1.0Vp-p with RV101 of BA board as shown in Fig. 3-1.

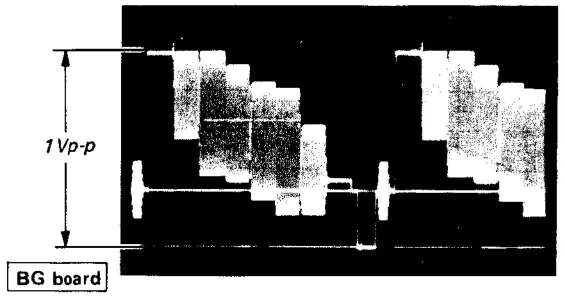


Fig. 3-1

BG board

4. Connect an oscilloscope to the TP1 of BG board.
5. Adjust to 1.0Vp-p with RV3 of BG board as shown in Fig. 3-1.
6. Connect an oscilloscope to the TP201 of BH board.

HB board

7. Adjust RV2 (SUB BRT) of HB board so that Ⓐ (black level) is 0V DC as shown in Fig. 3-2.
8. Adjust RV1 (SUB CONT) of HB board so that Ⓑ (100% white level) is -0.7V DC as shown in Fig. 3-2.

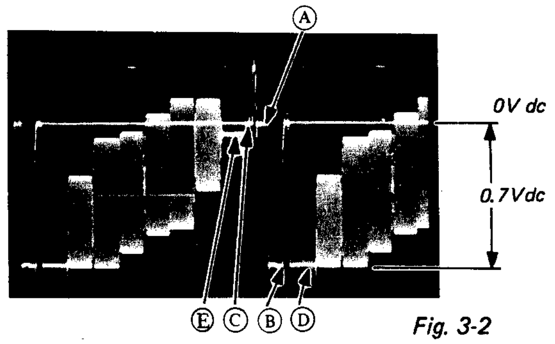


Fig. 3-2

Ⓐ . . . . . Black level
Ⓑ . . . . . 100% White level
Ⓒ . . . . . 0 IRE level
Ⓓ . . . . . 100 IRE level
Ⓔ . . . . . 7.5 IRE level

BH board

9. S2 (BH Board) . . . . 0 IRE

   Adjust RV1 of BH board so that the Ⓒ (0 IRE level) coincides with Ⓐ (Black level) as shown in Fig. 3-3.
10. Adjust RV3 of BH board so that the Ⓓ (100 IRE level) coincides with Ⓑ (100% white level) as shown in Fig. 3-3.

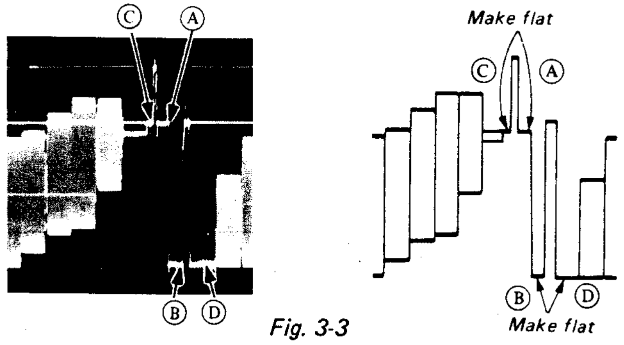


Fig. 3-3

BH board

11. S2 (BH Board) . . . . . 7.5 IRE
    Adjust RV2 of BH board so that the Ⓔ (7.5 IRE level) coincides with Ⓐ (Black level) as shown in Fig. 3-4.
12. Set S2 (BH Board) to 0 IRE.

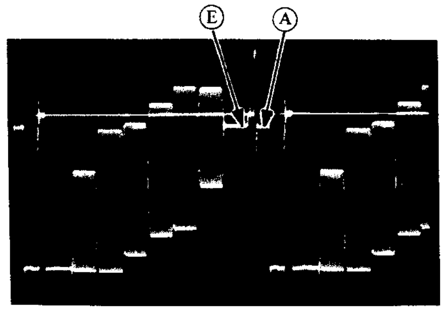
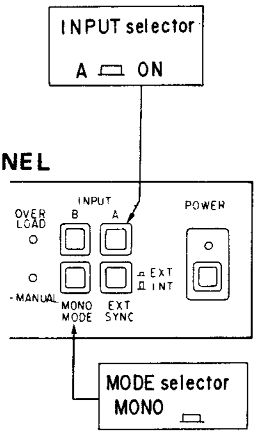
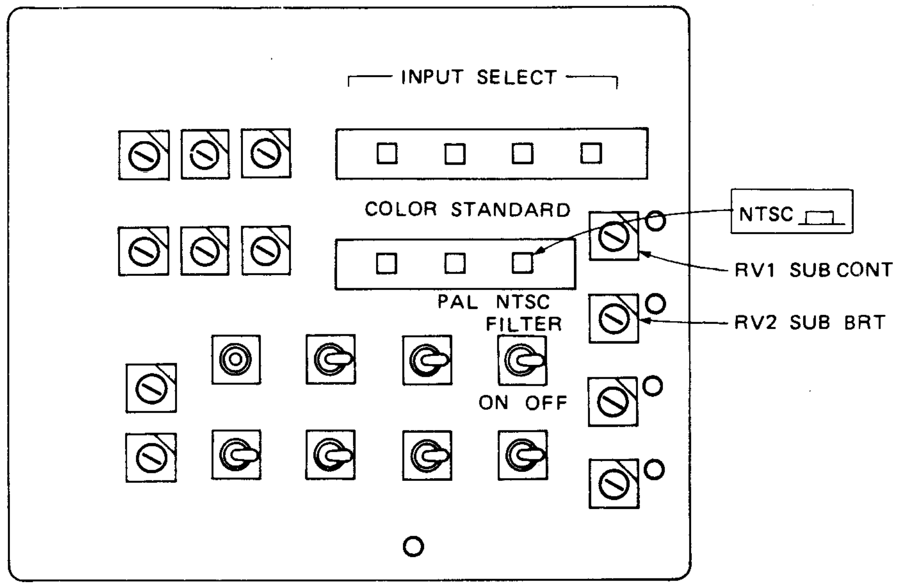


Fig. 3-4

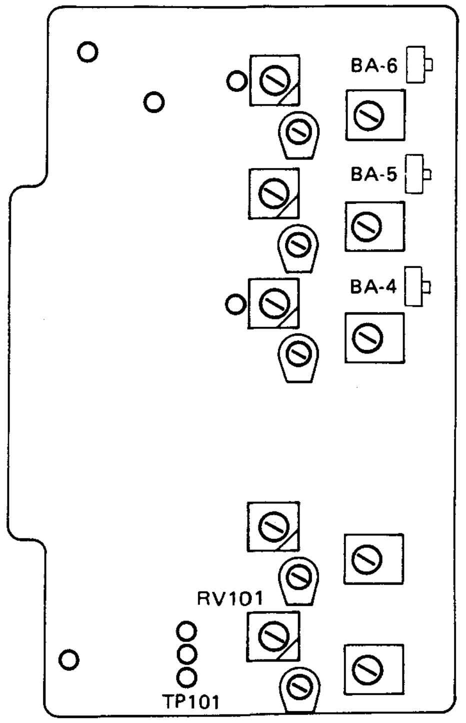
FRONT PANEL


INPUT selector
A ⊓ ON
OVER LOAD
INPUT
B A
POWER
EXT
INT
MANUAL
MONO MODE
EXT SYNC
MODE selector
MONO ⊓

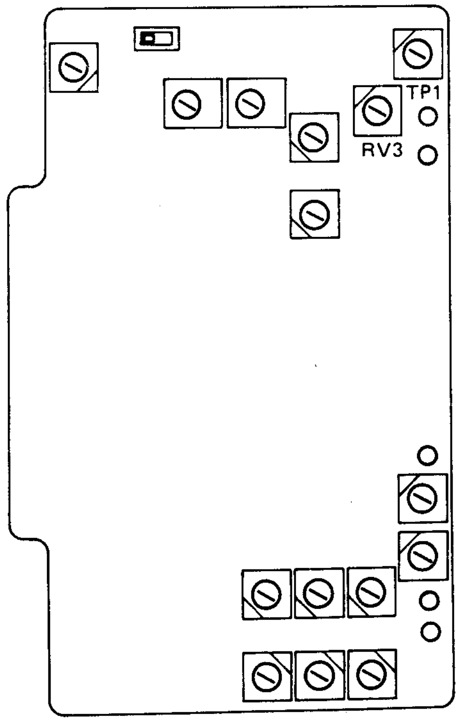
HB board


INPUT SELECT
COLOR STANDARD
PAL NTSC
FILTER
ON OFF
NTSC ⊓
RV1 SUB CONT
RV2 SUB BRT

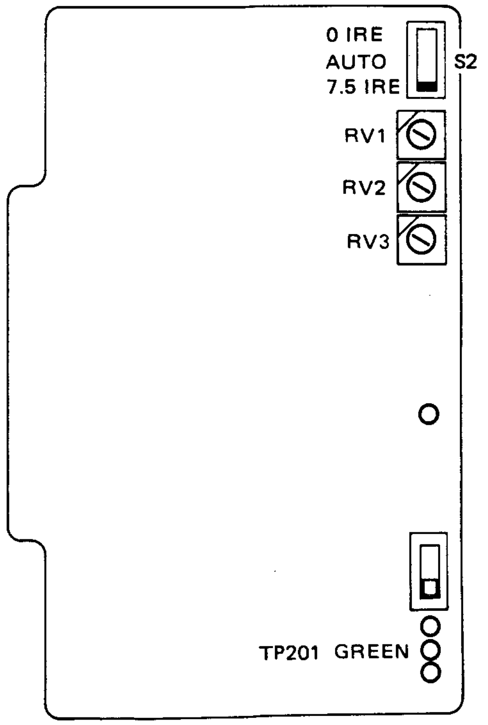
BA board


BA-6
BA-5
BA-4
RV101
TP101

BG board

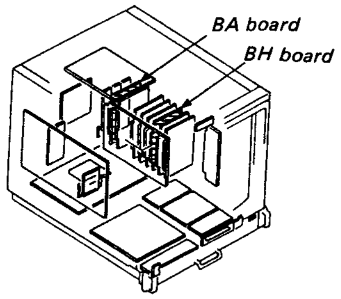


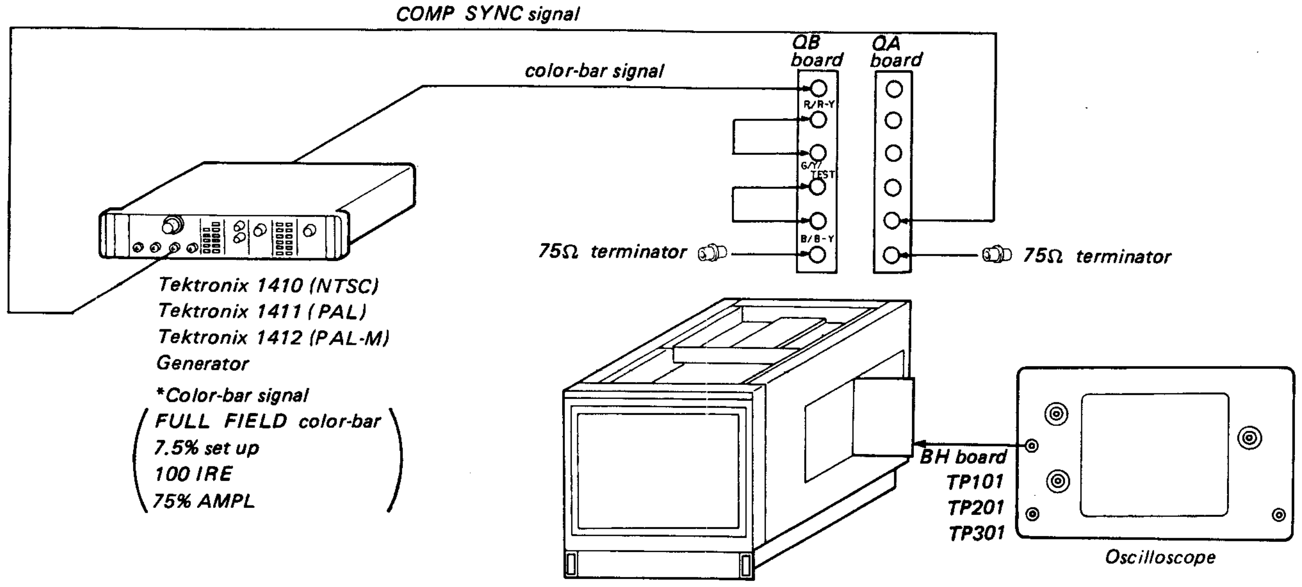
BH board


0 IRE
AUTO
7.5 IRE
S2
RV1
RV2
RV3
TP201 GREEN

BA board

13. Input a color-bar signal to VIDEO B terminal of the set.
    - INPUT selector (FRONT PANEL) ···················· B (▭)
    - SYNC selector (FRONT PANEL) ················ EXT (▭)
    - INPUT SELECT buttons (SUB CONTROL PANEL) ······················ RGB (▭)


BA board
BH board


COMP SYNC signal
color-bar signal
QB board
QA board
R/R-Y
G/Y TEST
B/B-Y
75Ω terminator
75Ω terminator
Tektronix 1410 (NTSC)
Tektronix 1411 (PAL)
Tektronix 1412 (PAL-M)
Generator
*Color-bar signal
FULL FIELD color-bar
7.5% set up
100 IRE
75% AMPL
BH board
TP101
TP201
TP301
Oscilloscope

14. Connect an oscilloscope to TP101 of BH board.
15. Adjust RV401 of BA board so that the Ⓓ (100 IRE level) coincides with Ⓑ (100% white level) as shown in Fig. 3-5.
16. Connect an oscilloscope to TP201 of BH board.
17. Adjust RV501 of BA board so that the Ⓓ (100 IRE level) coincides with Ⓑ (100% white level) as shown in Fig. 3-5.
18. Connect an oscilloscope to TP101 of BH board.
19. Adjust RV601 of BA board so that the Ⓓ (100 IRE level) coincides with Ⓑ (100% white level) as shown in Fig. 3-5.

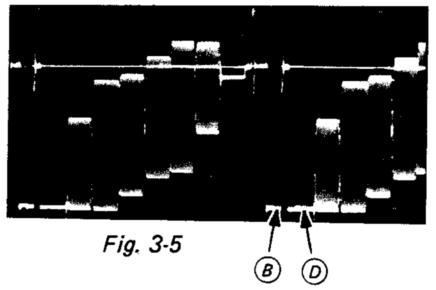
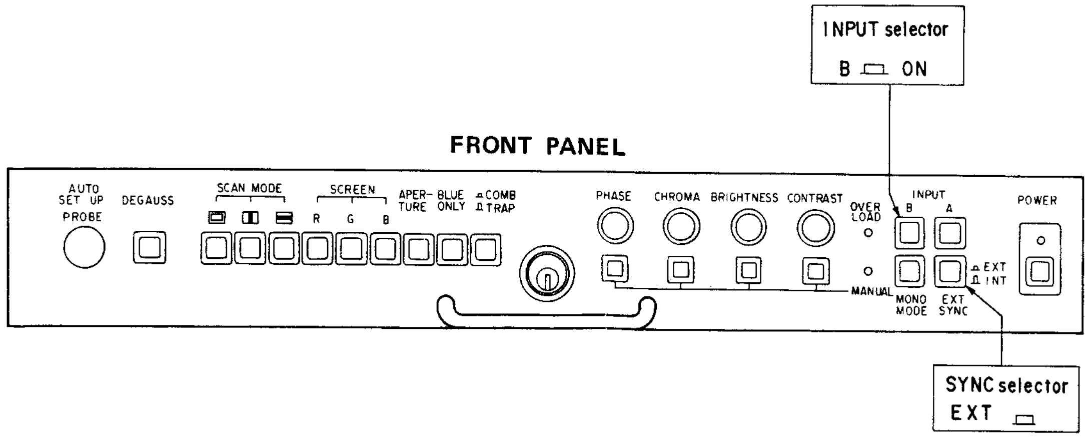
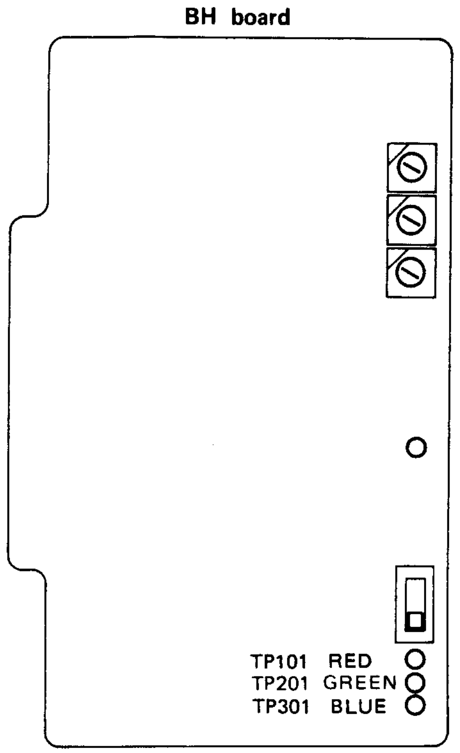
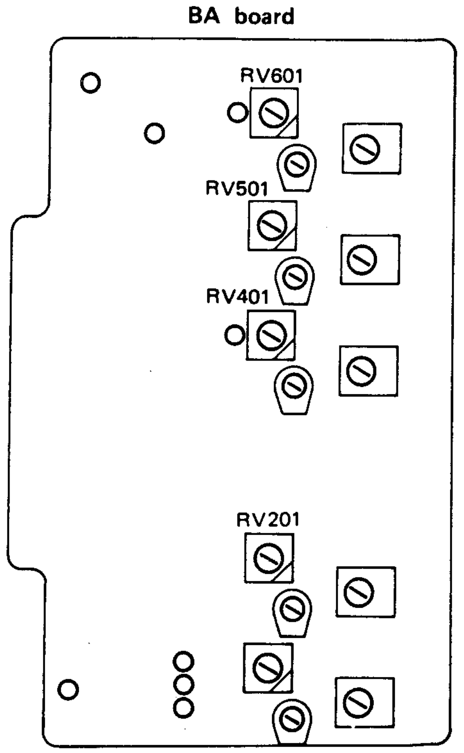
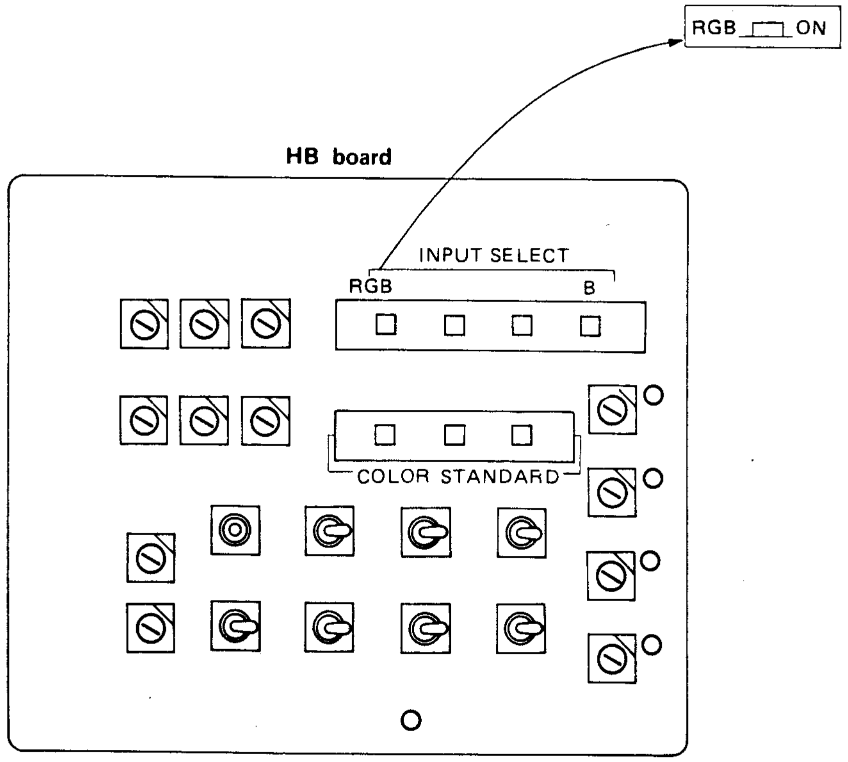


Fig. 3-5


INPUT selector
B ▭ ON
FRONT PANEL
AUTO SET UP PROBE
DEGAUSS
SCAN MODE
SCREEN
R
G
B
APER-TURE
BLUE ONLY
COMB TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
INPUT
B
A
POWER
MANUAL
MONO MODE
EXT SYNC
EXT
INT
SYNC selector
EXT ▭


BH board
TP101 RED
TP201 GREEN
TP301 BLUE


BA board
RV601
RV501
RV401
RV201


RGB ▭ ON
HB board
INPUT SELECT
RGB
B
COLOR STANDARD

4. BA Board INPUT CIRCUIT FREQUENCY CHARACTERISTIC ADJUSTMENT

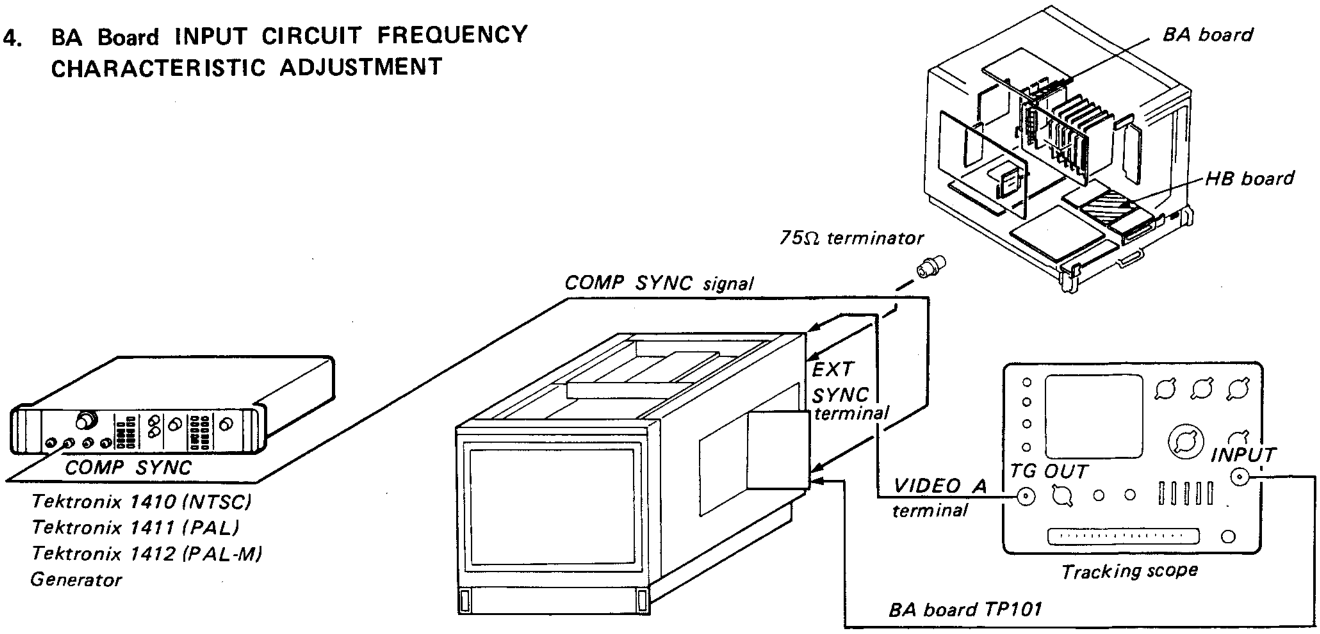

BA board
HB board
75Ω terminator
COMP SYNC signal
EXT SYNC terminal
VIDEO A terminal
TG OUT
INPUT
Tracking scope
BA board TP101
COMP SYNC
Tektronix 1410 (NTSC)
Tektronix 1411 (PAL)
Tektronix 1412 (PAL-M)
Generator

Fig. 4-1

1. Complete the connection as shown in Fig. 4-1.
   - INPUT selector . . . . A (⊓)
   - SYNC selector . . . . EXT (⊓)
   - CONTRAST control . . . . Minimum
   - BRIGHTNESS control . . . . Minimum
2. Adjust CV101 so that minimum as shown in Fig. 4-2.

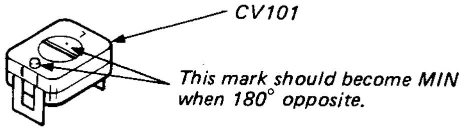

CV101
This mark should become MIN when 180° opposite.

Fig. 4-2

3. Adjust output waveform peak to 12MHz with CV102 of the BA board as shown in Fig. 4-3.

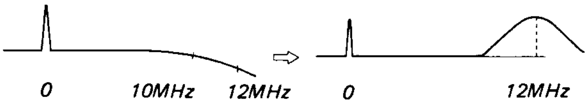


Fig. 4-3

4. Adjust CV101 of the BA board so that the output waveform becomes flat in a range of 0 to 10MHz as shown in Fig. 4-4.

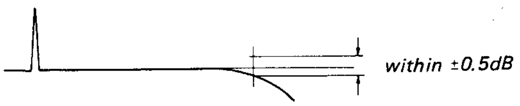
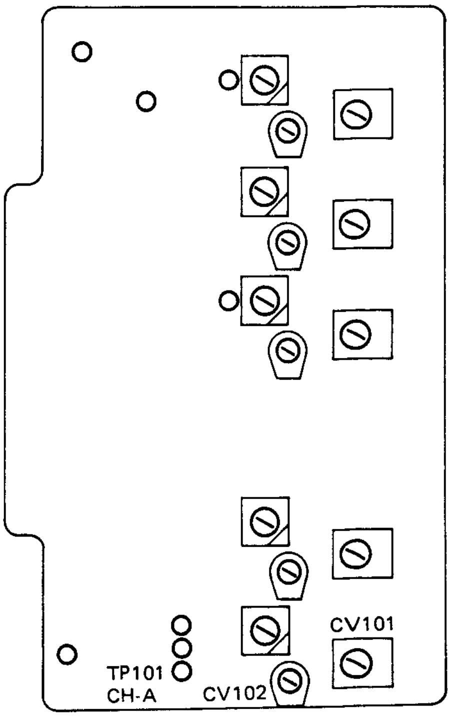
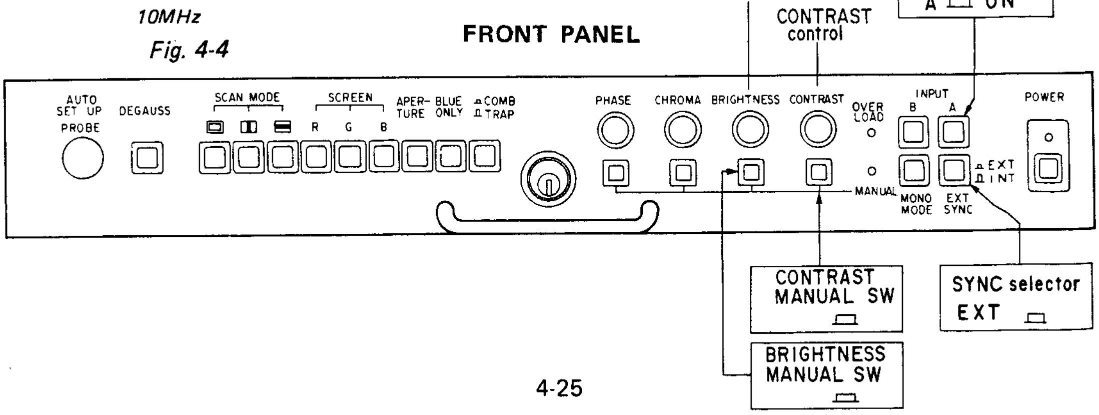


Fig. 4-4

BA board


CV101
TP101
CH-A
CV102

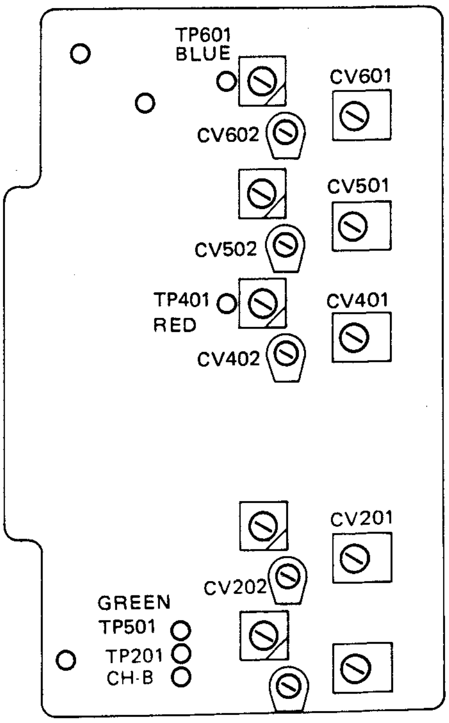
FRONT PANEL


BRIGHTNESS control
CONTRAST control
INPUT selector
A ⊓ ON
AUTO SET UP
PROBE
DEGAUSS
SCAN MODE
SCREEN
R G B
APER-TURE
BLUE ONLY
COMB
TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
INPUT
B A
EXT
INT
POWER
MANUAL
MONO MODE
EXT SYNC
CONTRAST MANUAL SW
⊓
SYNC selector
EXT ⊓
BRIGHTNESS MANUAL SW
⊓

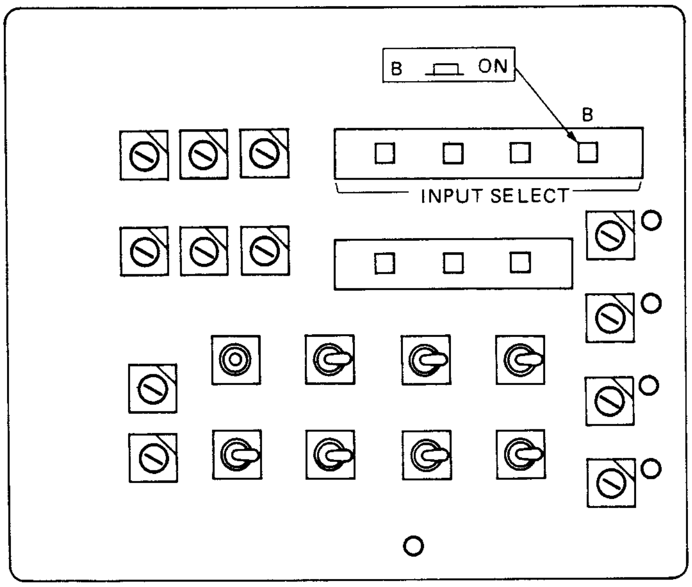
5. In the same way, perform the adjustment for B CH, under the following conditions.

INPUT	INPUT selector (FRONT PANEL (A)	INPUT SELECT buttons (SUB CONTROL PANEL)	TP (BA board)	CV (BA board)
B	B	B	TP201	CV201, 202
R/R-Y	B	RGB	TP401	CV401, 402
G/Y/TEST	B	RGB	TP501	CV501, 502
B/B-Y	B	RGB	TP601	CV601, 602

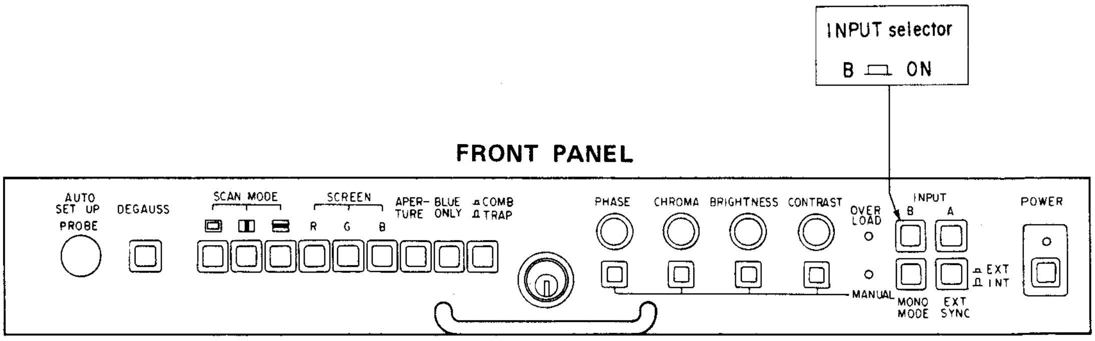
BA board


TP601
BLUE
CV601
CV602
CV501
CV502
TP401
RED
CV401
CV402
CV201
GREEN
TP501
CV202
TP201
CH-B

HB board


B ⊓ ON
B
INPUT SELECT

FRONT PANEL


INPUT selector
B ⊓ ON
AUTO SET UP PROBE
DEGAUSS
SCAN MODE
SCREEN
R
G
B
APER-TURE
BLUE ONLY
⊓ COMB
⊔ TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
INPUT
B
A
POWER
MANUAL
MONO MODE
EXT SYNC
⊓ EXT
⊔ INT

5. BG BOARD FREQUENCY CHARACTERISTIC ADJUSTMENT

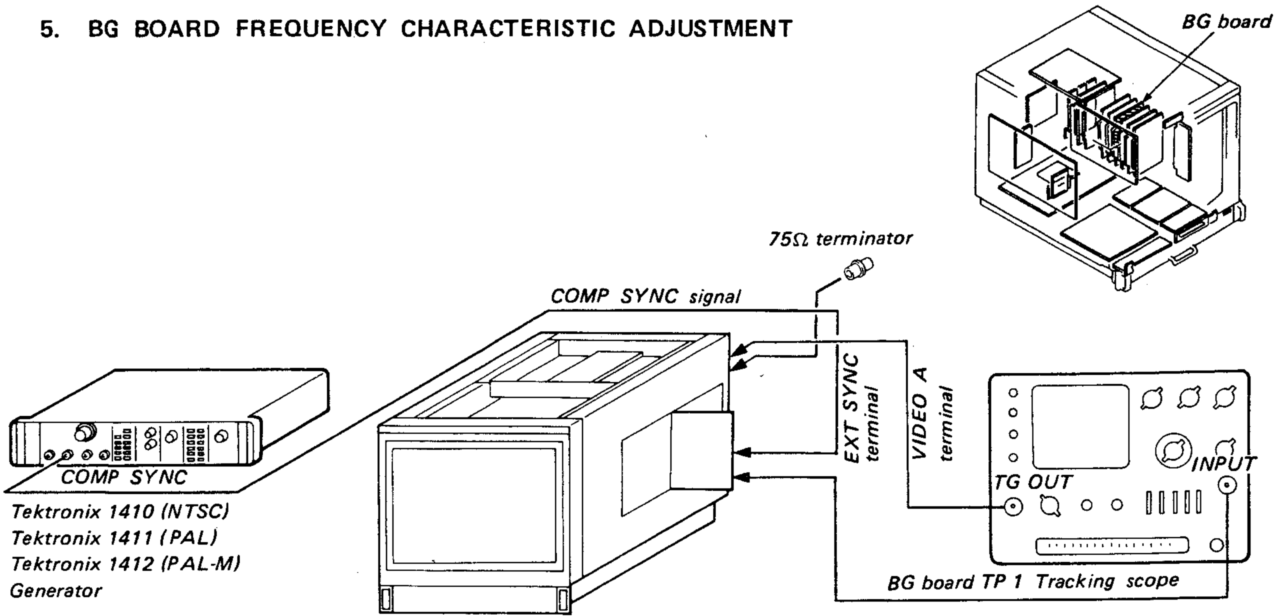
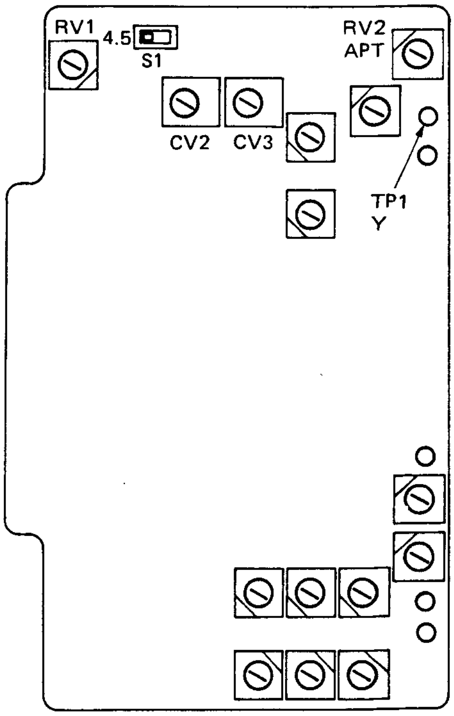

BG board
75Ω terminator
COMP SYNC signal
EXT SYNC terminal
VIDEO A terminal
COMP SYNC
TG OUT
INPUT
BG board TP 1 Tracking scope
Tektronix 1410 (NTSC)
Tektronix 1411 (PAL)
Tektronix 1412 (PAL-M)
Generator

Fig. 5-1

1. Complete the connections as shown in Fig. 5-1.
   - INPUT selector (FRONT PANEL) . . . . A (⊓)
   - SYNC selector (FRONT PANEL) . . . . EXT (⊓)
   - CONTRAST control . . . . Minimum
   - BRIGHTNESS control . . . . Minimum
   - S1 (BG Board) . . . . 4.5MHz (*4.5* ▣ *6.5*)
2. Adjust RV1, CV2 and CV3 of the BG board so that the output waveform becomes flat in a range of 0 to 10MHz as shown in Fig. 5-2. (within 0±0.5dB)

*Waveform movement by RV1, CV2, CV3

BG board


RV1
4.5
S1
RV2
APT
CV2
CV3
TP1
Y

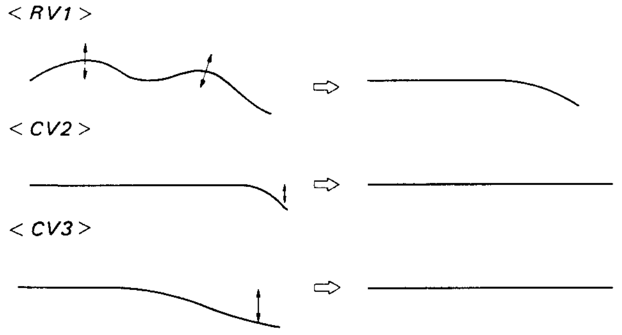


Fig. 5-2

3. Adjust with RV2 (BG board) to the position in which the APT (Fig. 5-3.) begins to become effective.

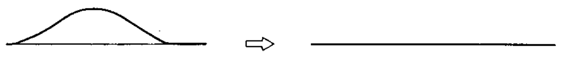
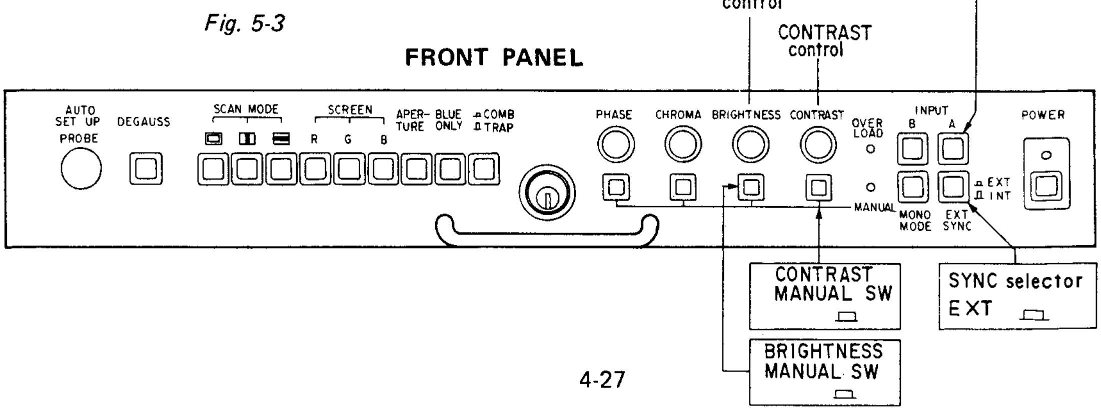


Fig. 5-3

FRONT PANEL


INPUT selector
A ⊓ ON
BRIGHTNESS control
CONTRAST control
AUTO SET UP PROBE
DEGAUSS
SCAN MODE
SCREEN
R G B
APER-TURE
BLUE ONLY
⊓ COMB
⊔ TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
MANUAL
INPUT
B A
MONO MODE
EXT SYNC
⊓ EXT
⊔ INT
POWER
CONTRAST MANUAL SW ⊓
SYNC selector EXT ⊓
BRIGHTNESS MANUAL SW ⊓

6. COMPONENT INPUT LEVEL ADJUSTMENT

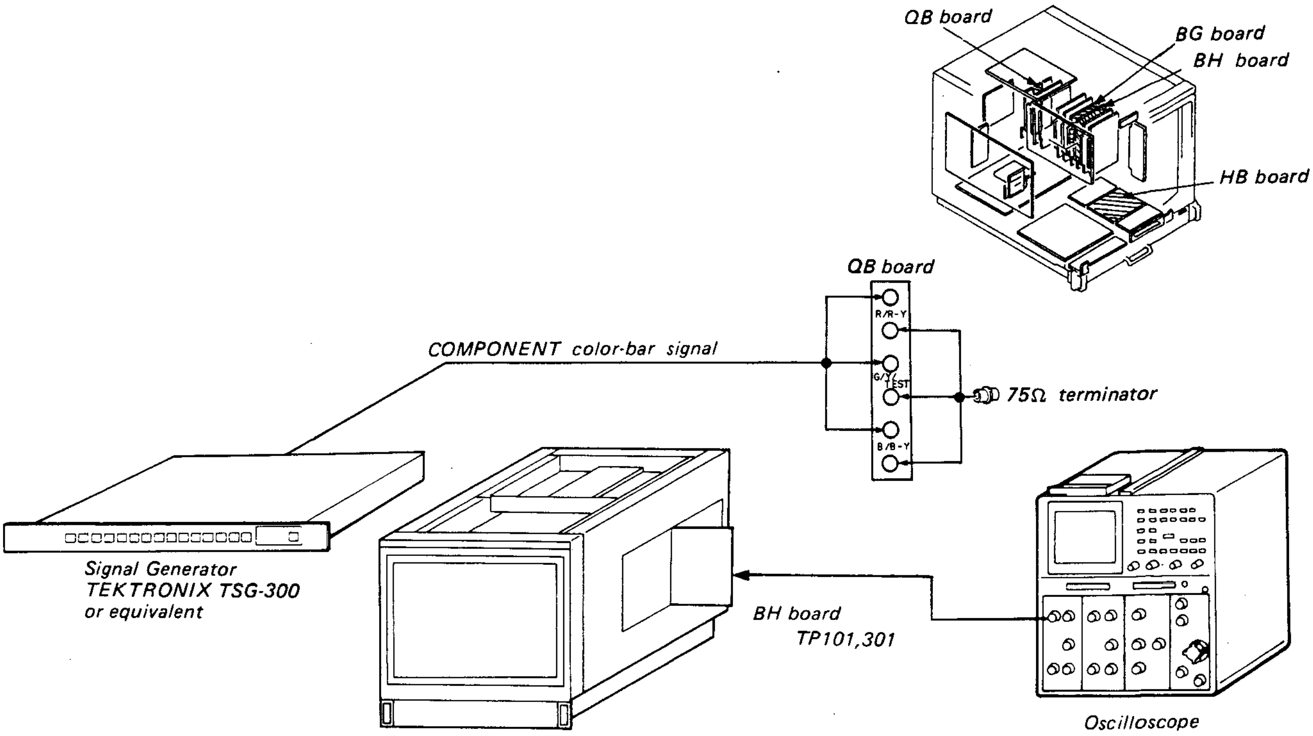

QB board
BG board
BH board
HB board
QB board
R/R-Y
G/Y
TEST
B/B-Y
COMPONENT color-bar signal
75Ω terminator
Signal Generator
TEKTRONIX TSG-300
or equivalent
BH board
TP101,301
Oscilloscope

Fig. 6-1

1. Complete the connections as shown in Fig. 6-1.
   - INPUT selector ························ B (FRONT PANEL)
   - INPUT SELECT buttons (SUB CONTROL PANEL)
     (HB board) .... COMPONENT
2. Connect an oscilloscope to the TP-101 of BH board.
3. Adjust RV21 of BG board so that the output waveform becomes flat. (Fig. 6-2)
4. Connect an oscilloscope to the TP301 of BH board.
5. Adjust RV22 of BG board so that the input waveform becomes flat. (Fig. 6-3)

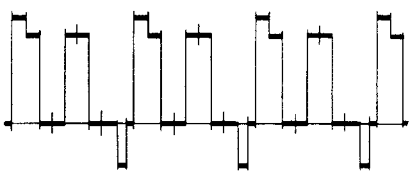


Fig. 6-2

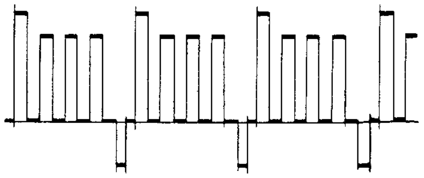
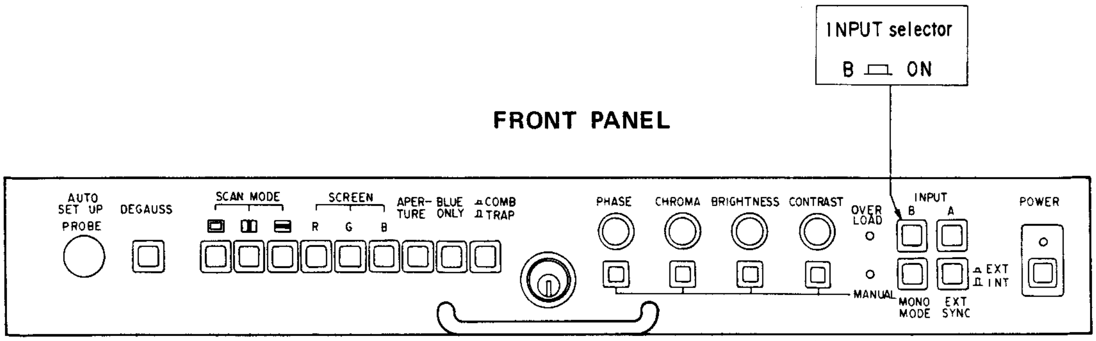
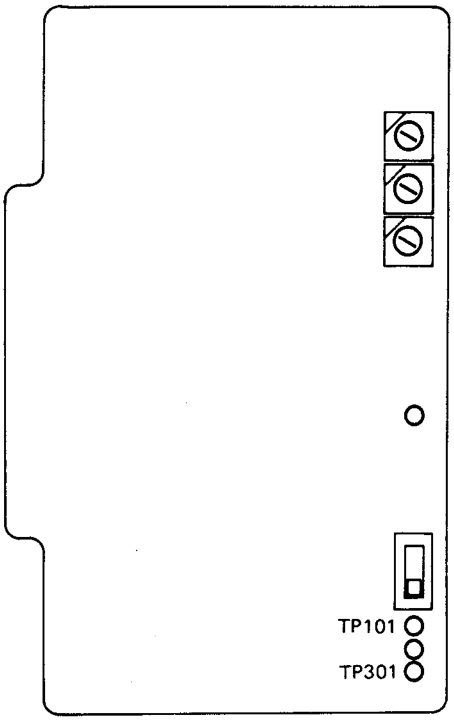


Fig. 6-3

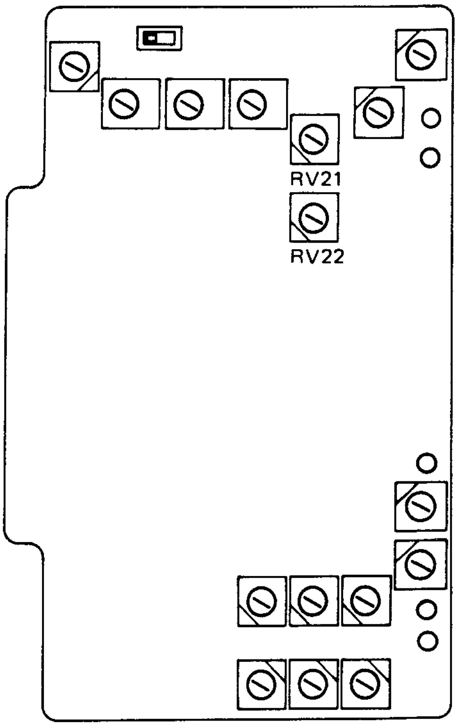
FRONT PANEL


INPUT selector
B ⊓ ON
AUTO
SET UP
PROBE
DEGAUSS
SCAN MODE
SCREEN
R G B
APER-TURE
BLUE ONLY
COMB
TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
INPUT
B A
POWER
EXT
INT
MANUAL
MONO MODE
EXT SYNC

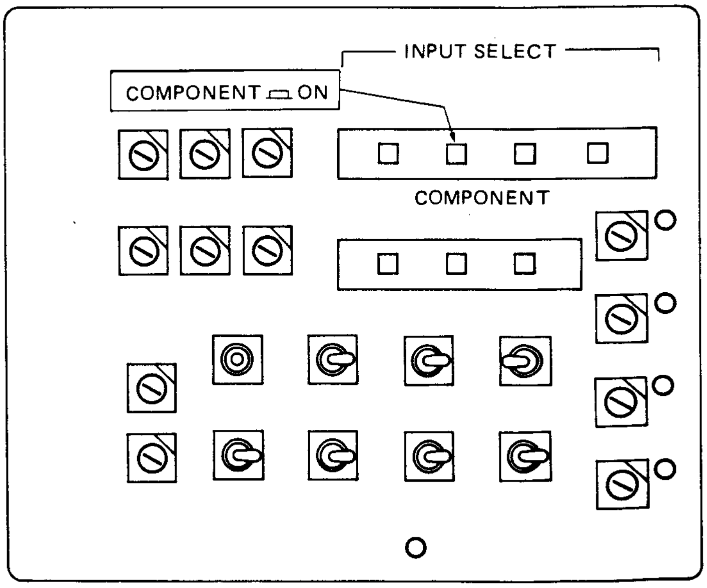


BH board

TP101
TP301



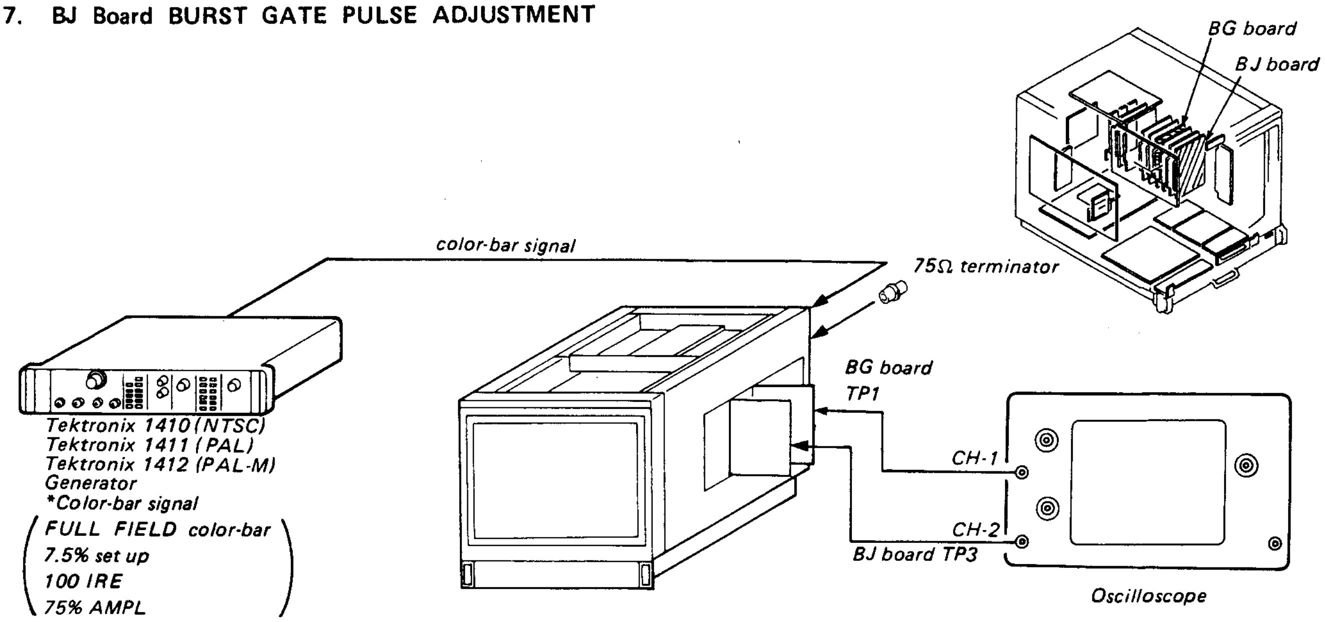
BG board



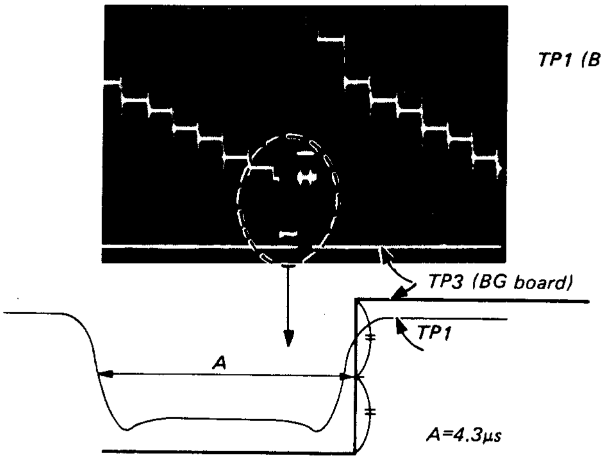
HB board

INPUT SELECT
COMPONENT ▭ ON
COMPONENT

7. BJ Board BURST GATE PULSE ADJUSTMENT


BG board
BJ board
color-bar signal
75Ω terminator
BG board
TP1
CH-1
CH-2
BJ board TP3
Oscilloscope
Tektronix 1410 (NTSC)
Tektronix 1411 (PAL)
Tektronix 1412 (PAL-M)
Generator
*Color-bar signal
FULL FIELD color-bar
7.5% set up
100 IRE
75% AMPL

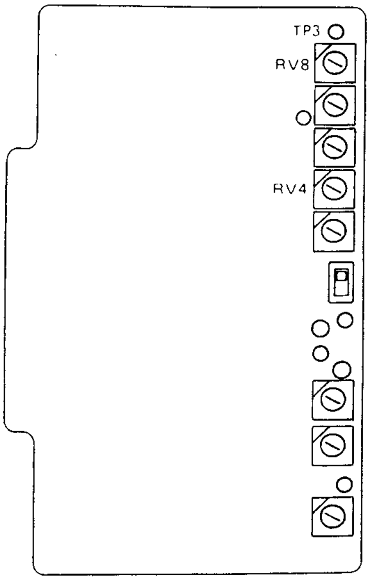
1. Input a color-bar signal to the VIDEO A terminal of the set.
2. Connect an oscilloscope (CH-1 probe) to the TP1 of BG board and connect an oscilloscope (CH-2 probe) to the TP3 of BJ board.
3. Adjust RV8 of BJ board so that the A is 4.3μs as shown in Fig. 7-1.



* *Adjust (A), from SYNC fall to B.G.P. (BURST GATE PULSE) rise, to 4.3μs.*

Fig. 7-1

BJ board



4. Adjust RV4 of BJ board so that the burst gate pulse width is 3.9 μs as shown in Fig. 7-2.

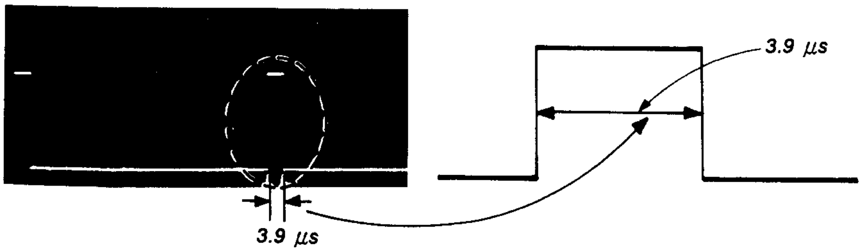
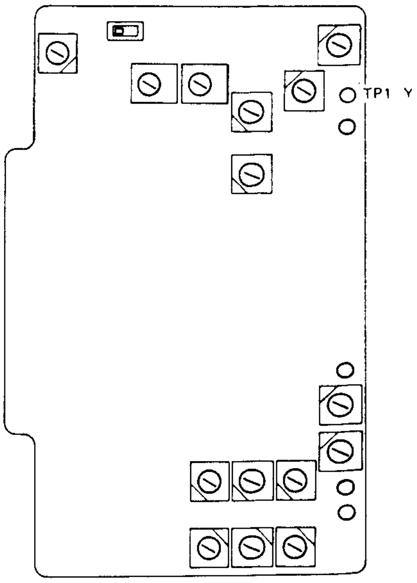
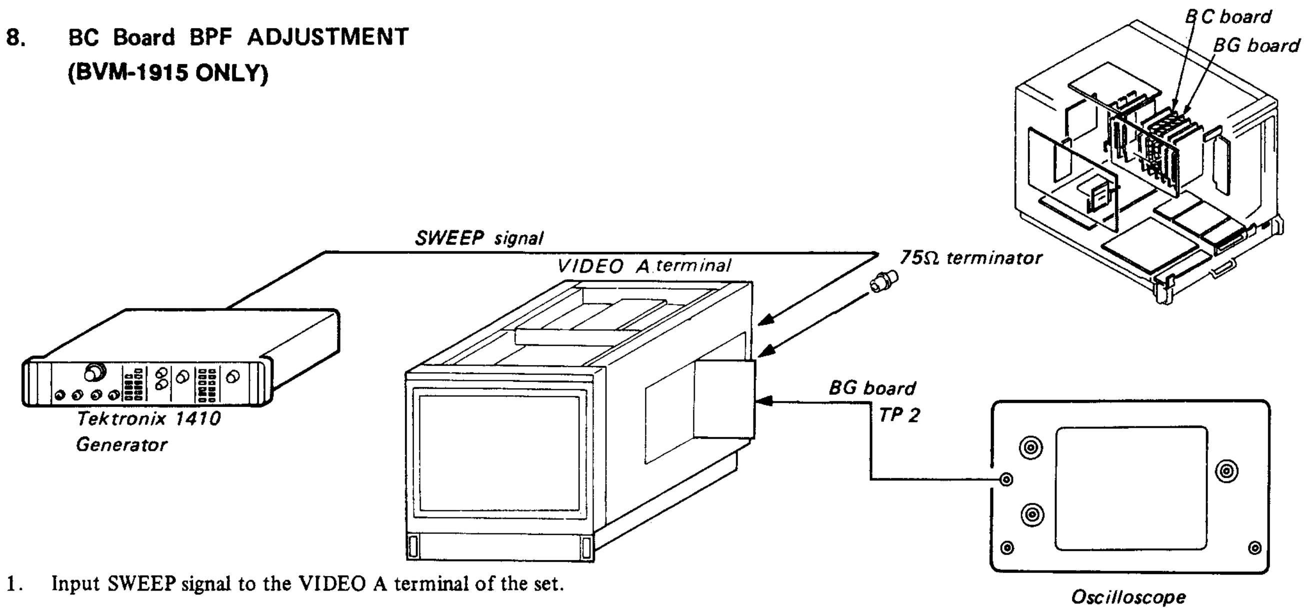


Fig. 7-2

BG board



8. BC Board BPF ADJUSTMENT (BVM-1915 ONLY)


BC board
BG board
SWEEP signal
VIDEO A terminal
75Ω terminator
Tektronix 1410
Generator
BG board
TP 2
Oscilloscope

1. Input SWEEP signal to the VIDEO A terminal of the set.
2. Connect an oscilloscope to the TP2 on the BG board.
3. Make the V/dw of oscilloscope into VARIABLE, and match the upper section of waveform to 7 div as shown in Fig. 8-1.

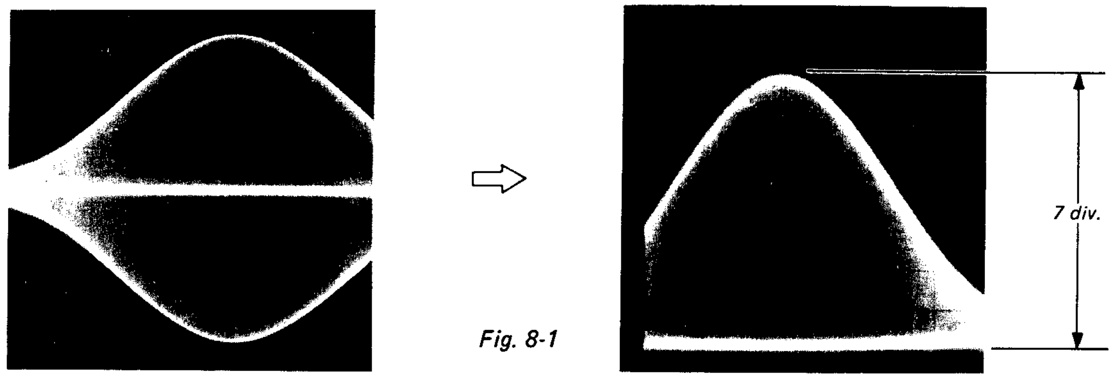
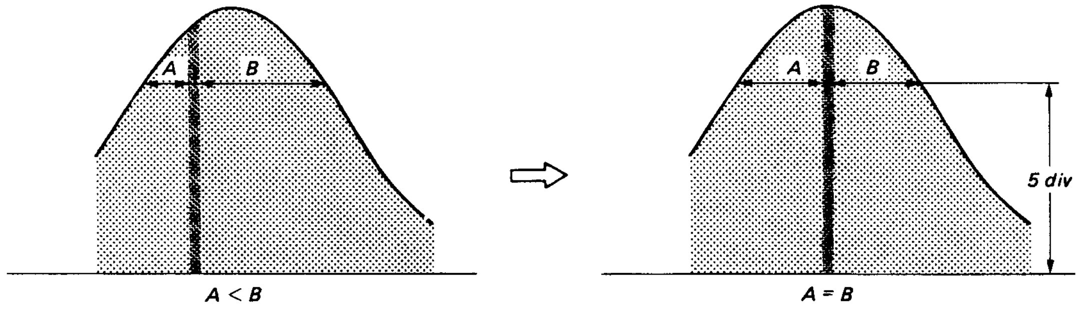


Fig. 8-1

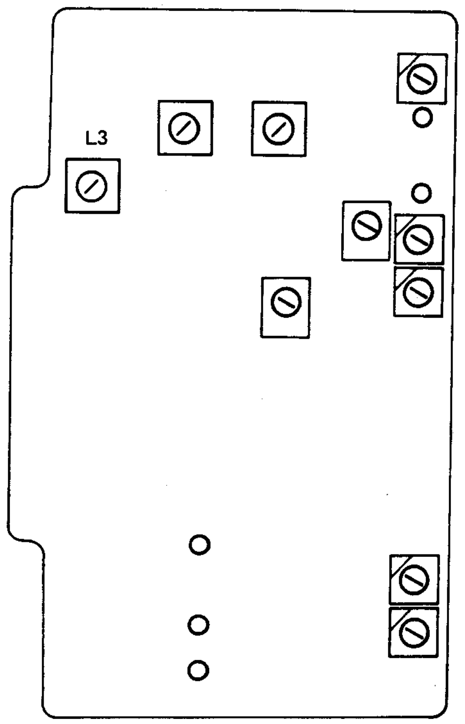
4. Adjust L3 on the BC board so that A is equal to B as shown in Fig. 8-2.


A
B
A < B
A
B
5 div
A = B

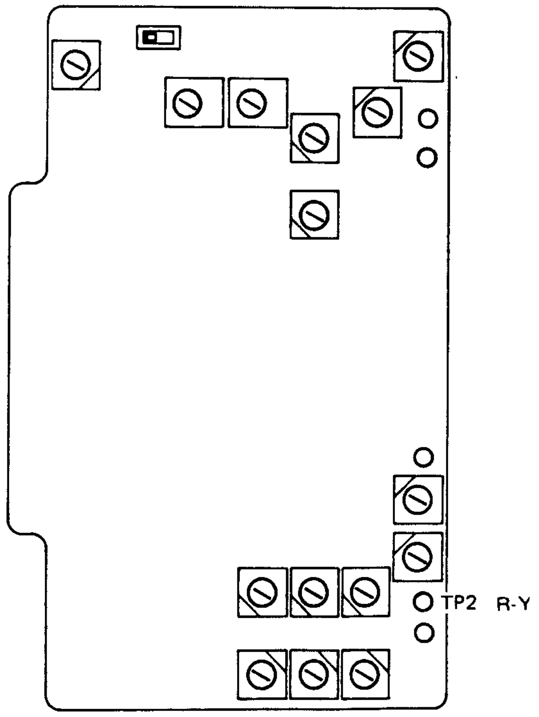
A is equal to B when the amplitude is 5 div.

Fig. 8-2

BC board



BG board



9. BC BOARD PHASE SHIFT ADJUSTMENT (BVM-1915 ONLY)

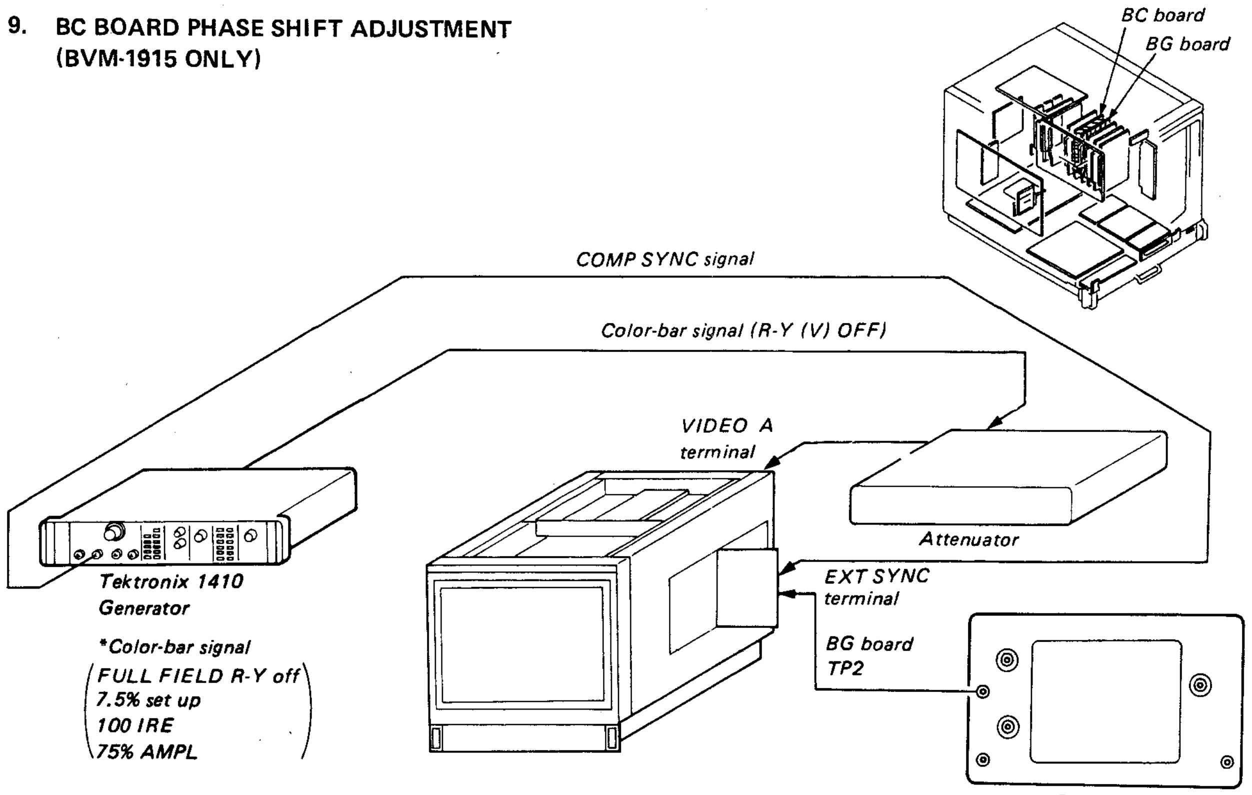

BC board
BG board
COMP SYNC signal
Color-bar signal (R-Y (V) OFF)
VIDEO A terminal
Attenuator
EXT SYNC terminal
BG board TP2
Tektronix 1410 Generator
*Color-bar signal
FULL FIELD R-Y off
7.5% set up
100 IRE
75% AMPL
Oscilloscope

Fig. 9-1

1. Complete the connection as shown in Fig. 9-1.
   - INPUT selector (FRONT PANEL). . . . . A (▭)
   - SYNC selector (FRONT PANEL) . . . . EXT (▭)
2. Connect an oscilloscope to the TP2 on the BG board.
3. Make the waveform flat with the PHASE control of front panel (R) as shown in Fig. 9-2.
4. Attenuate the signal by 10dB by using attenuator.
5. Adjust RV3 on the BC board so that the output waveform becomes flat as shown in Fig. 9-2.
6. Restore the attenuator to 0dB.
7. Repeat the steps 3 to 5.

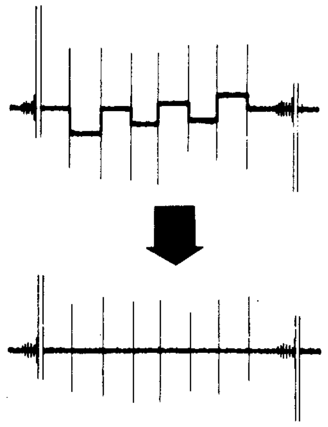
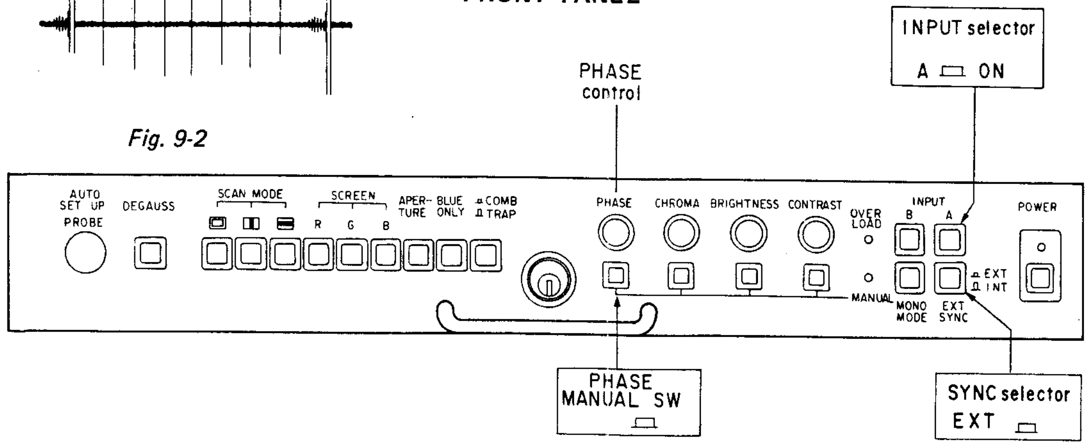
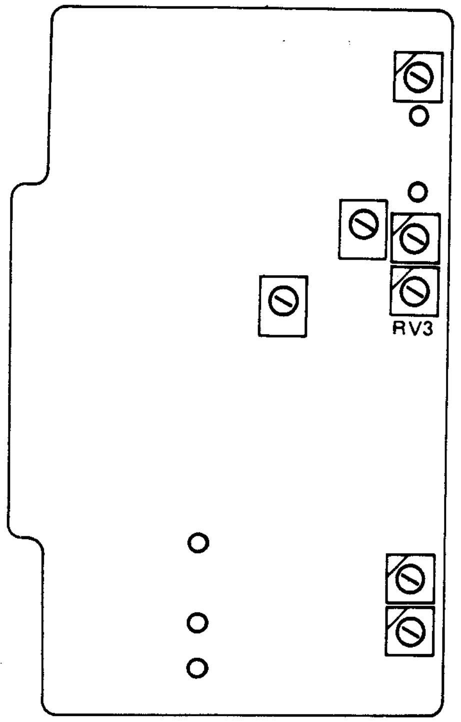


Fig. 9-2

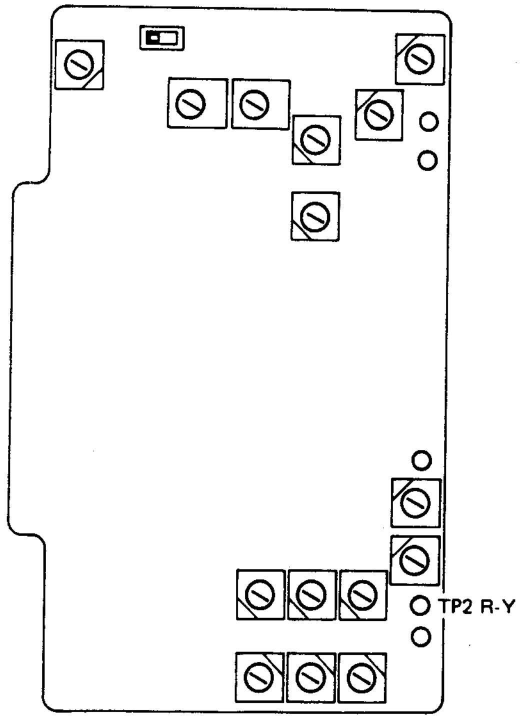
FRONT PANEL


INPUT selector
A ▭ ON
PHASE control
AUTO SET UP PROBE
DEGAUSS
SCAN MODE
SCREEN
R G B
APER-TURE
BLUE ONLY
COMB TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
INPUT
B A
POWER
MANUAL
MONO MODE
EXT SYNC
EXT
INT
PHASE MANUAL SW
SYNC selector
EXT ▭

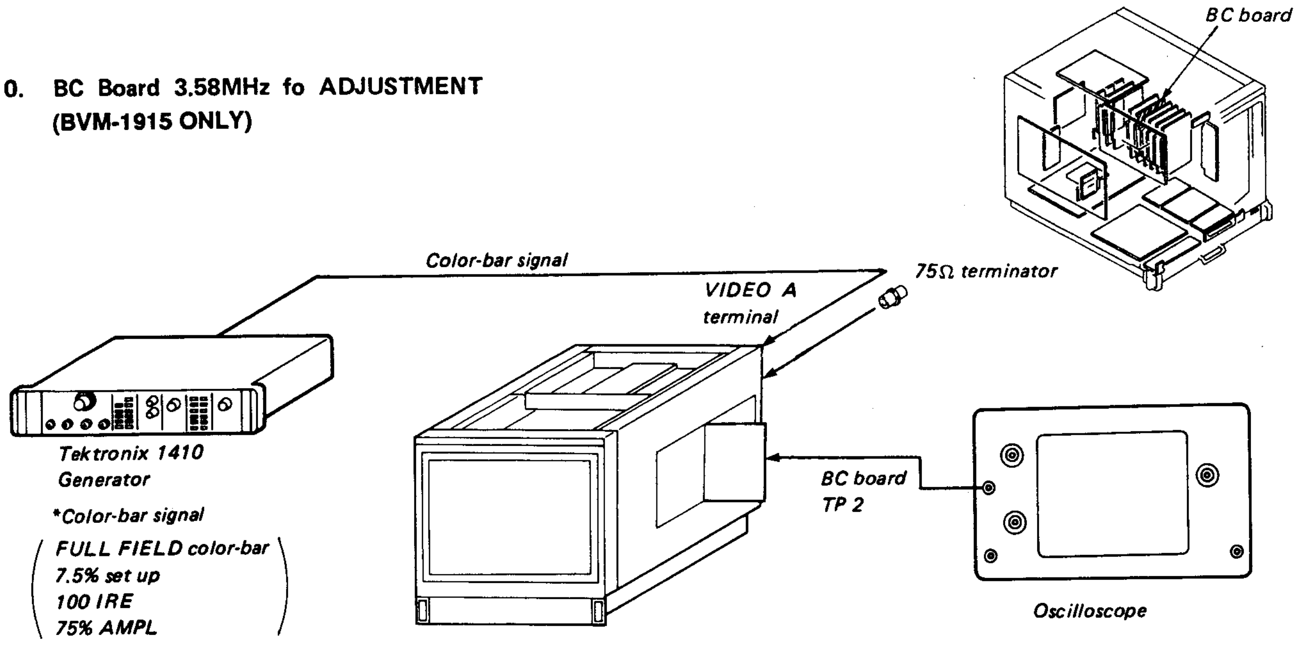
BC board



BG board



10. BC Board 3.58MHz fo ADJUSTMENT (BVM-1915 ONLY)


BC board
Color-bar signal
VIDEO A terminal
75Ω terminator
Tektronix 1410 Generator
*Color-bar signal
FULL FIELD color-bar
7.5% set up
100 IRE
75% AMPL
BC board TP 2
Oscilloscope

1. Input color-bar signal to the VIDEO A terminal of the set.
2. Connect an oscilloscope to the TP2 of BC board.
3. Short-circuit between TP ⑥ and ⑦ of BC board with a jumper wire.
4. Adjust CV2 of BC board so that the output waveform is shifted slowly as shown in Fig. 10-1.
5. Turn off the power of this monitor, and disconnect TP ⑥ and ⑦ of BC board.

TP2 on the BC board

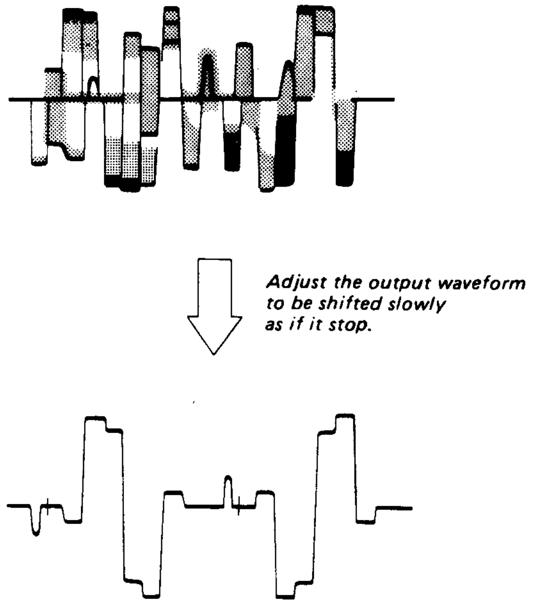
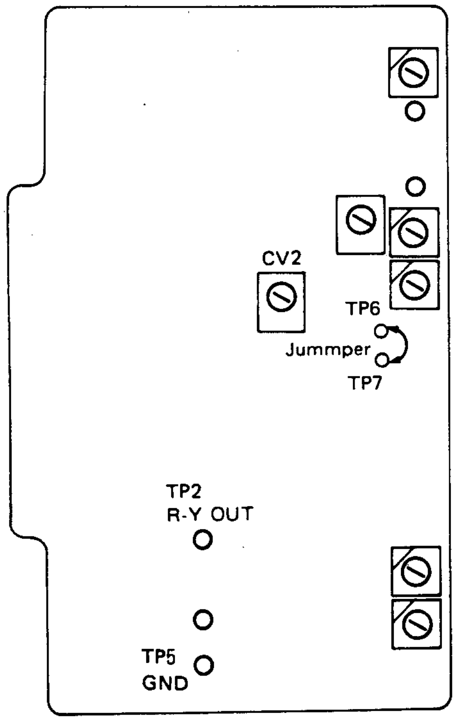

Adjust the output waveform
to be shifted slowly
as if it stop.

Fig. 10-1

BC board


CV2
TP6
Jummper
TP7
TP2
R-Y OUT
TP5
GND

11. BC Board COLOR DIFFERENCE PHASE ADJUSTMENT (BVM-1915 ONLY)

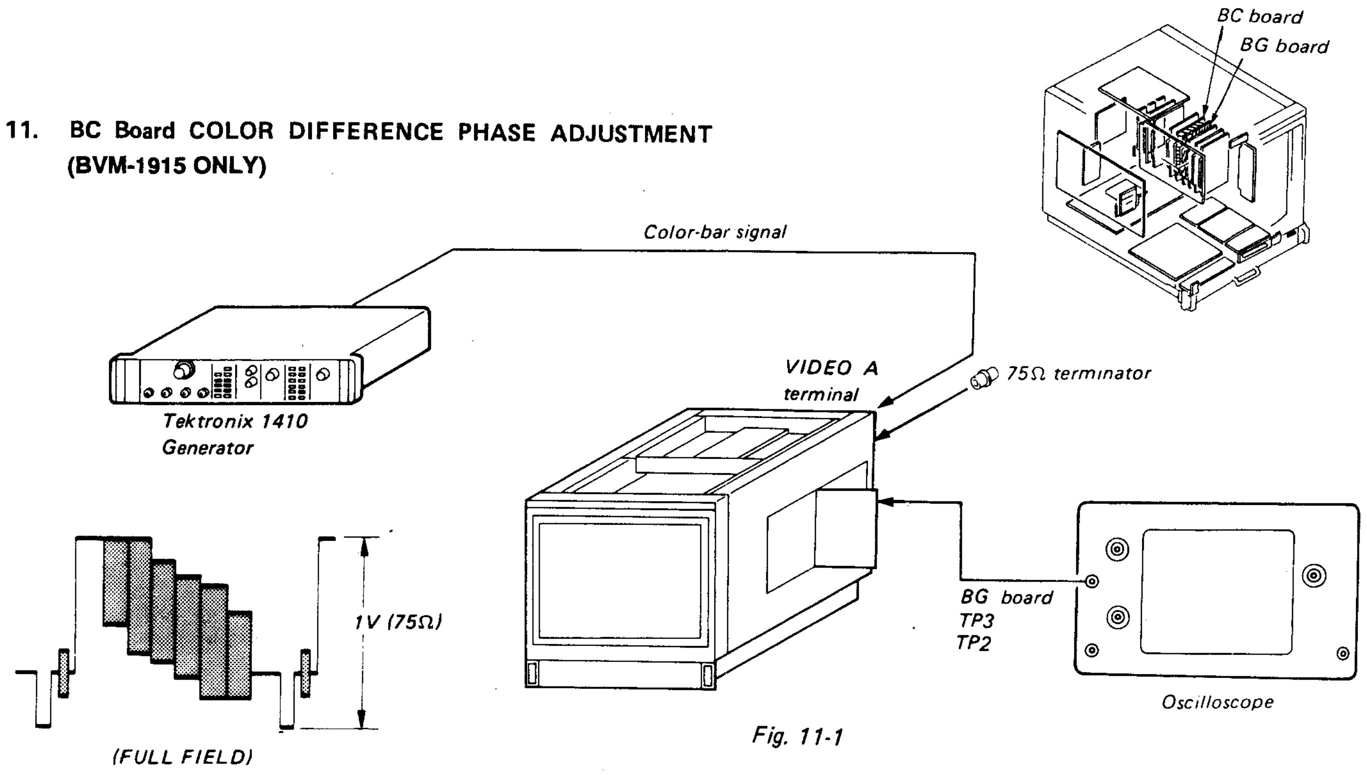

BC board
BG board
Color-bar signal
Tektronix 1410
Generator
VIDEO A
terminal
75Ω terminator
1 V (75Ω)
BG board
TP3
TP2
Oscilloscope
(FULL FIELD)

Fig. 11-1

1. Complete the connections as shown in Fig. 11-1.
2. Turn on the power of this monitor.

B-Y System Adjustment

3. Connect the oscilloscope probe to TP3 on the BG board, and turn off the (B-Y) signal of the signal generator.
4. Set the oscilloscope sensitivity to 20mV/DIV, and adjust RV2 on the BC board so that the ouput waveform is flat. (See Fig. 11-2.)

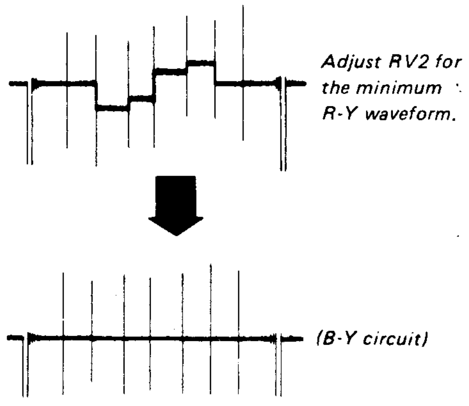

Adjust RV2 for the minimum R-Y waveform.
(B-Y circuit)

Fig. 11-2

Quad Adjustment

5. Connect the oscilloscope probe to TP2 on the BG board. Turn on the B-Y signal of the signal generator, and turn off the (R-Y) signal. Then adjust CV1 on the BC board so that the output waveform is flat. (See Fig. 11-3)
6. Repeat the steps 3 to 6.

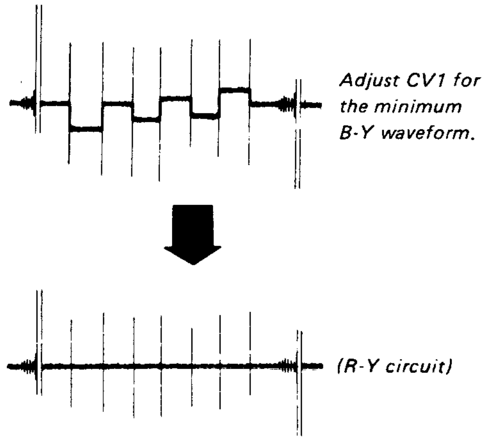
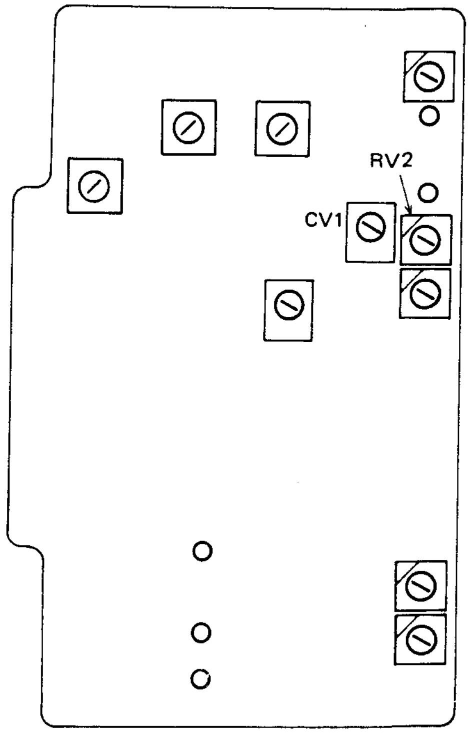
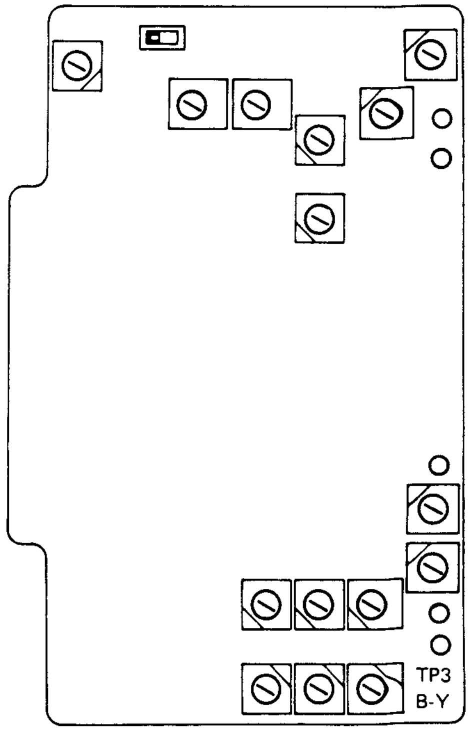

Adjust CV1 for the minimum B-Y waveform.
(R-Y circuit)

Fig. 11-3

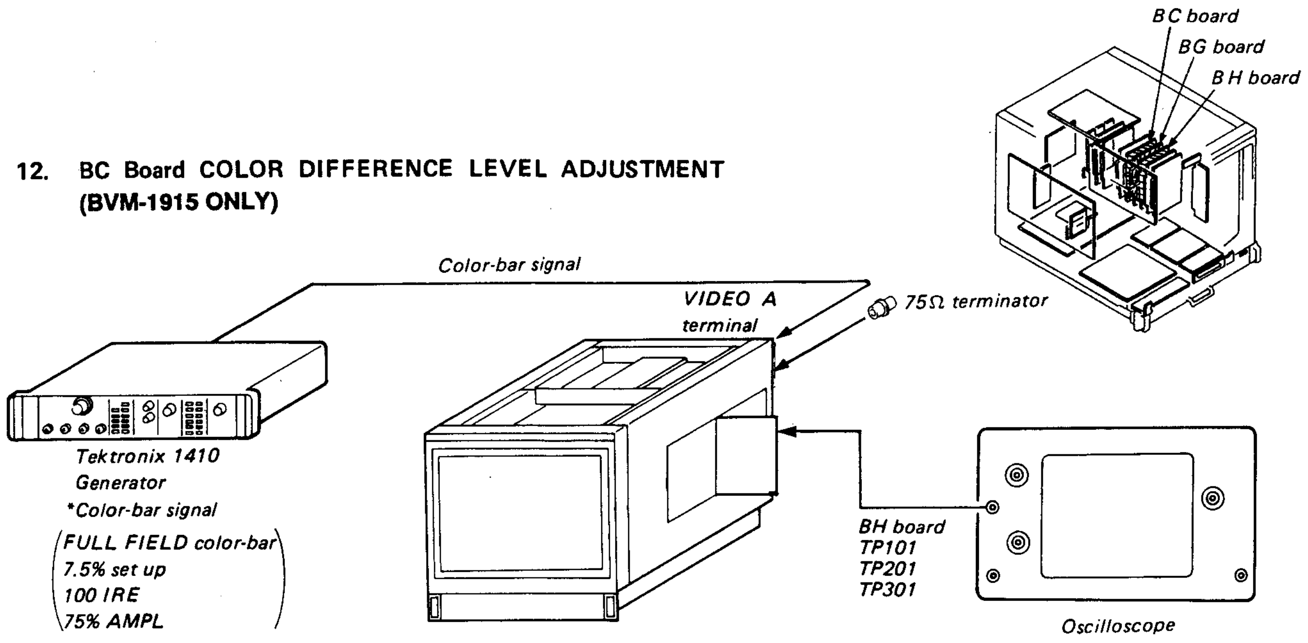
BC Board



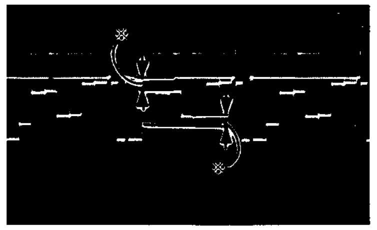
BG Board



12. BC Board COLOR DIFFERENCE LEVEL ADJUSTMENT (BVM-1915 ONLY)


BC board
BG board
BH board
Color-bar signal
VIDEO A terminal
75Ω terminator
Tektronix 1410
Generator
*Color-bar signal
FULL FIELD color-bar
7.5% set up
100 IRE
75% AMPL
BH board
TP101
TP201
TP301
Oscilloscope

1. Input color-bar signal to the VIDEO A terminal of the set.
2. Connect an oscilloscope to the TP101 of BH board.
3. Eliminate interval in the output waveform (mark ✱ in Fig. 12-1) with RV4.

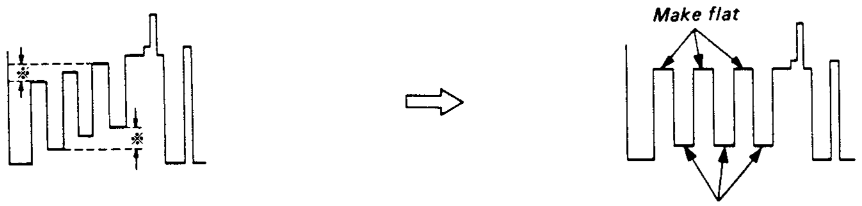


- Bring ✱ marked levels to zero respectively with RV4 on the BC board.

TP101 R OUT

Fig. 12-1

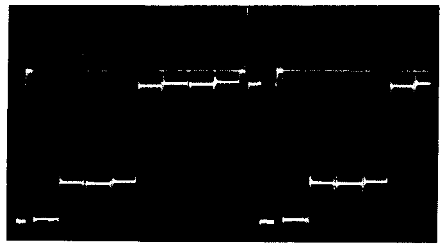
4. Connect an oscilloscope to the TP301 of BH board.
5. Adjust RV5 of BC board so that the output waveform as shown in Fig. 12-2.


Make flat
Make flat

TP103 B OUT

Fig. 12-2

6. Connect an oscilloscope to the TP201 of BH board.
7. Adjust RV4 and RV5 of BG board so that the INPUT waveform becomes flat as shown in Fig. 12-3.



TP201 G OUT

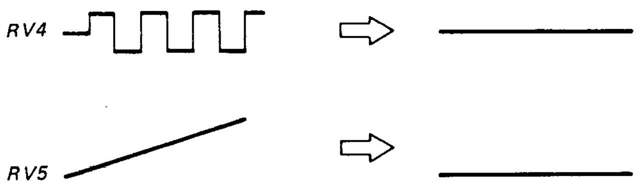
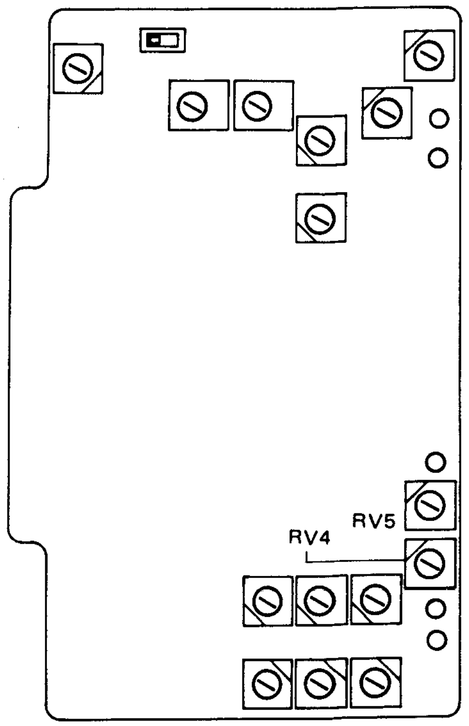
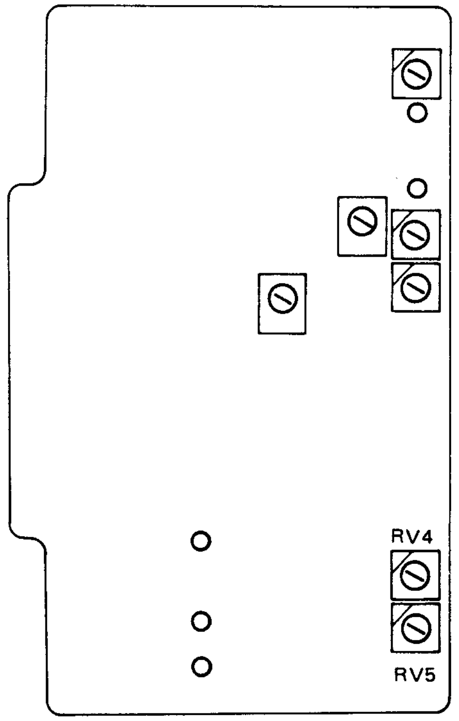


Fig. 12-3

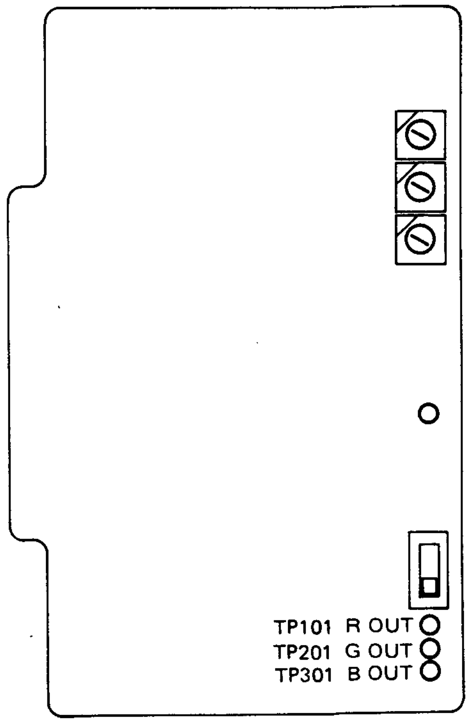
BG board



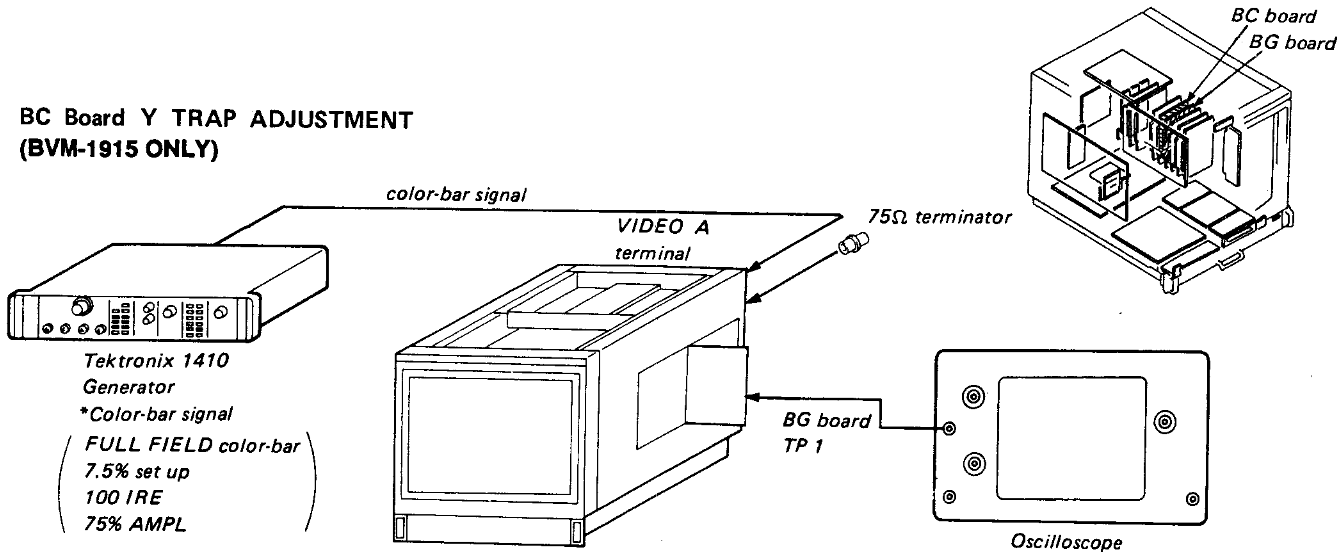
BC Board



BH Board


TP101 R OUT
TP201 G OUT
TP301 B OUT

13. BC Board Y TRAP ADJUSTMENT (BVM-1915 ONLY)


BC board
BG board
color-bar signal
VIDEO A terminal
75Ω terminator
Tektronix 1410 Generator
*Color-bar signal
FULL FIELD color-bar
7.5% set up
100 IRE
75% AMPL
BG board TP 1
Oscilloscope

1. Input color-bar signal to VIDEO A terminal of the set.
   - INPUT selector (FRONT PANEL) . . . . A(▭)
   - COLOR STANDARD buttons (SUB CONTROL PANEL) . . . . . NTSC(▭)
2. Connect an oscilloscope to the TP1 of BG board.
3. Adjust L1 of BC board so that 3.58MHz subcarrier is minimum as shown in Fig. 13-1.

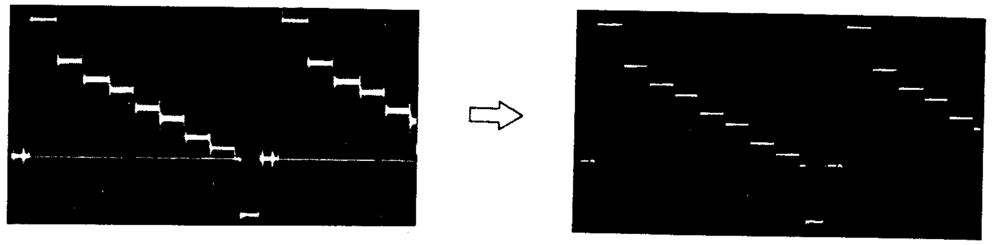
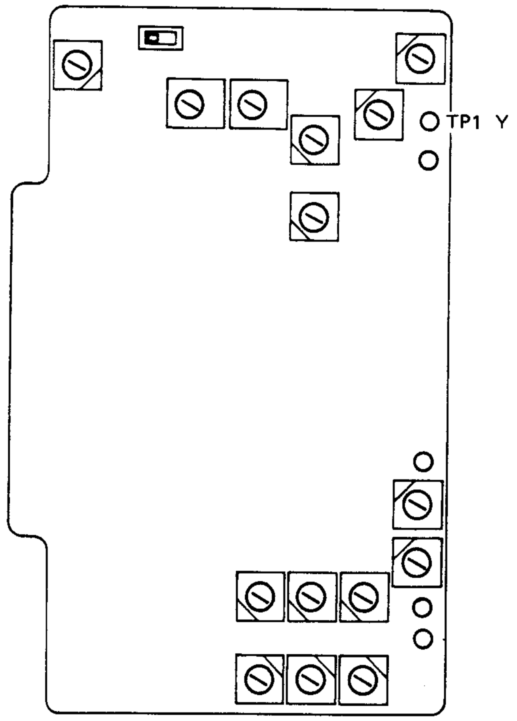
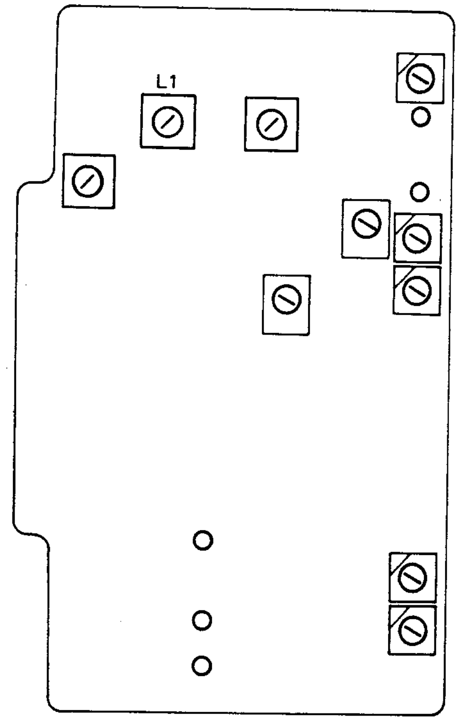


Fig. 13-1

BG board



BC board



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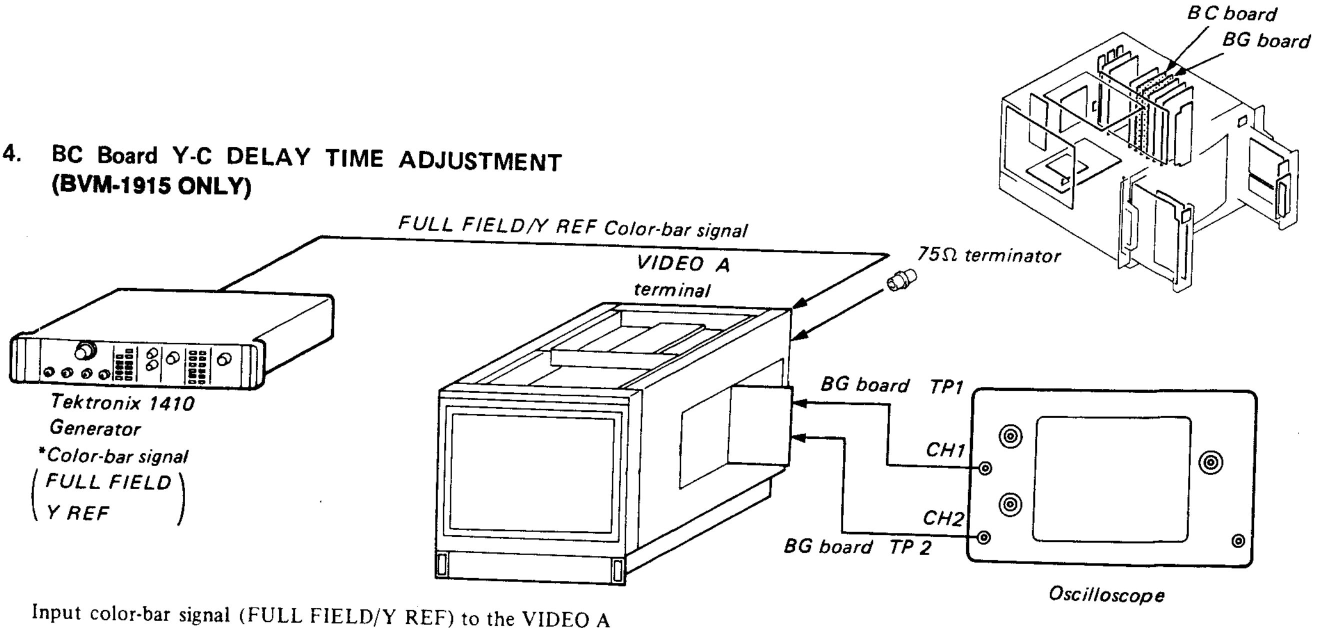
14. BC Board Y-C DELAY TIME ADJUSTMENT (BVM-1915 ONLY)


BC board
BG board
FULL FIELD/Y REF Color-bar signal
VIDEO A terminal
75Ω terminator
Tektronix 1410 Generator
*Color-bar signal
FULL FIELD
Y REF
BG board TP1
CH1
CH2
BG board TP 2
Oscilloscope

1. Input color-bar signal (FULL FIELD/Y REF) to the VIDEO A terminal of the set.
2. Connect an oscilloscope (CH-1 probe) to the TP1 of BG board and connect an oscilloscope (CH-2 probe) to the TP2 of BG board (VERT mode of the oscilloscope is CHOP).
3. Adjust RV1 of BC board so that the output waveform as shown in Fig. 14-1.

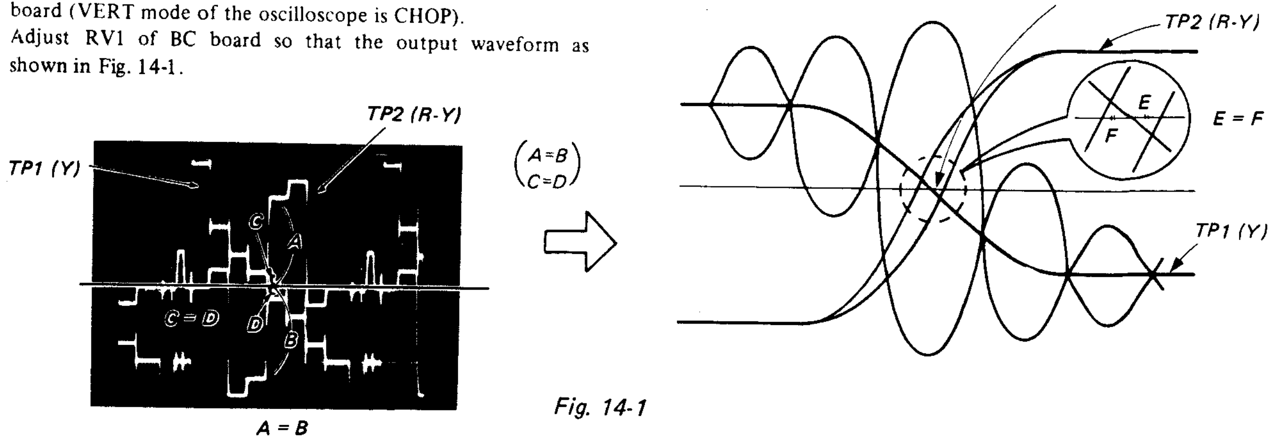
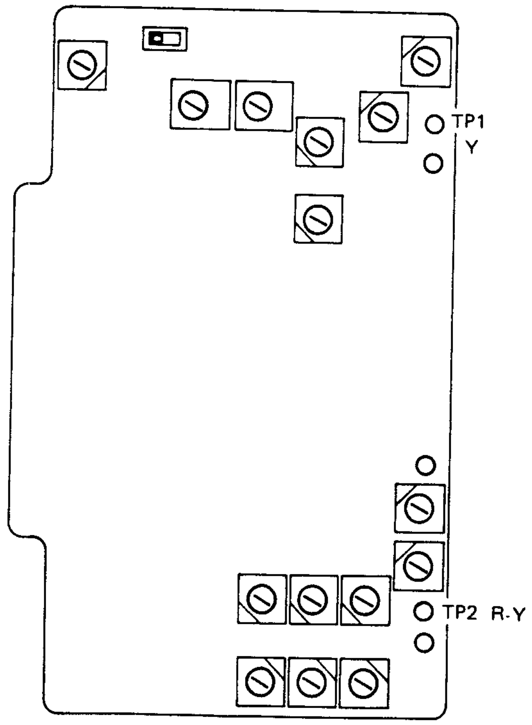
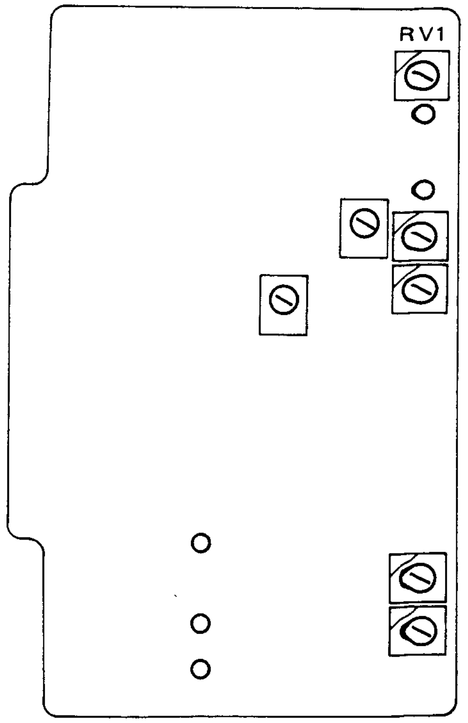

TP2 (R-Y)
TP1 (Y)
C
A
C = D
D
B
A = B
(A=B C=D)
Adjust RV1 so that E is equal to F.
TP2 (R-Y)
E
F
E = F
TP1 (Y)

Fig. 14-1

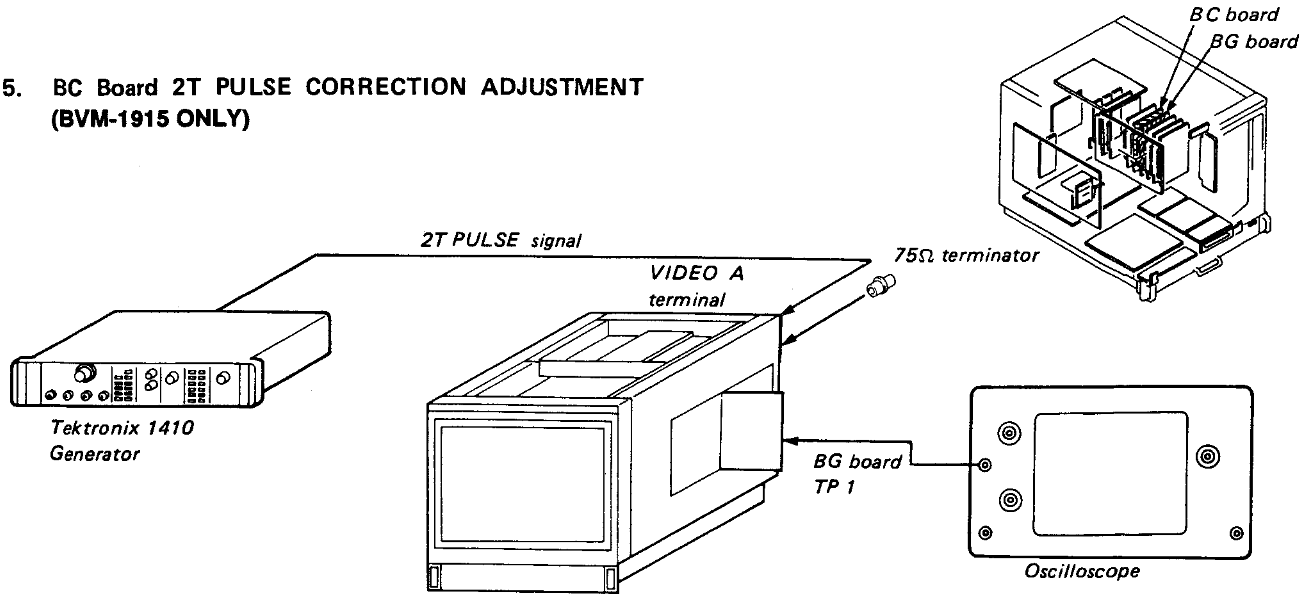
BG Board



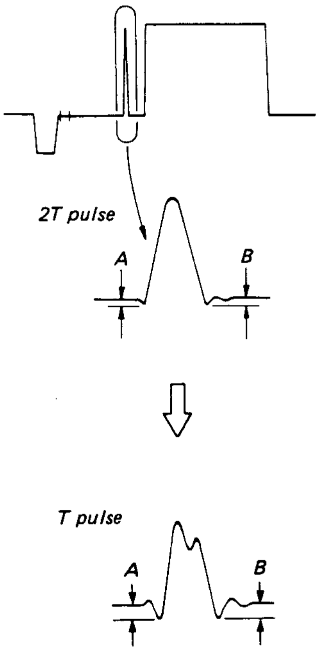
BC Board



15. BC Board 2T PULSE CORRECTION ADJUSTMENT (BVM-1915 ONLY)


BC board
BG board
2T PULSE signal
VIDEO A terminal
75Ω terminator
Tektronix 1410 Generator
BG board TP 1
Oscilloscope

1. Input 2T pulse signal to VIDEO A terminal of the set.
2. Connect an oscilloscope to the TP1 of BG board.
3. Adjust L2 of BC board so that A is equal to B as shown in Fig. 15-1.
4. Change the input signal from 2T pulse to T pulse, and make sure the waveform balance is not lost extremely as shown in Fig. 15-1.

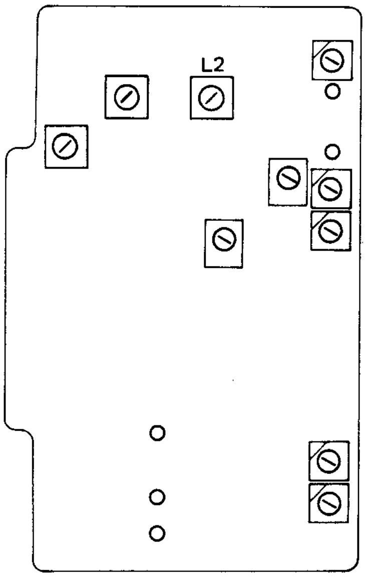

2T pulse
A
B
T pulse
A
B

* *Adjust L2 to obtain the condition A = B.*

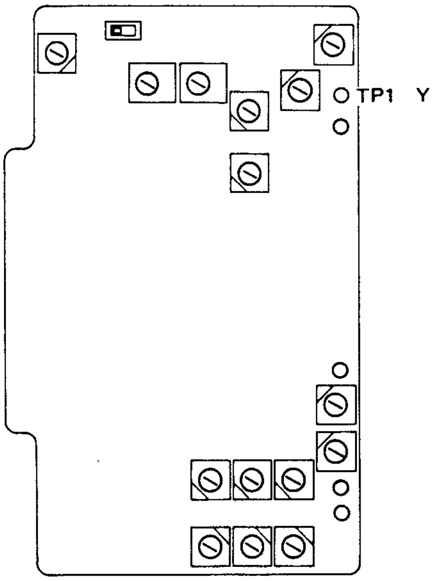
* *The waveform balance should not be lost extremely.*

Fig. 15-1

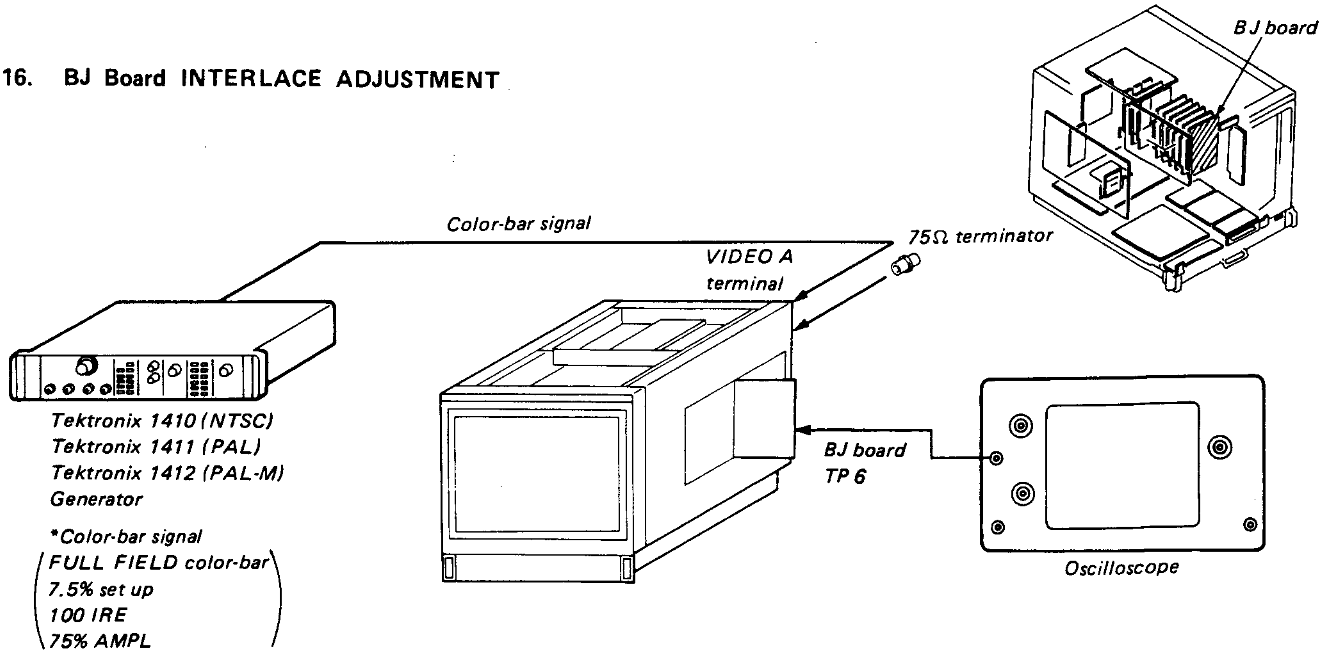
BC board



BG board



16. BJ Board INTERLACE ADJUSTMENT


B J board
Color-bar signal
75Ω terminator
VIDEO A terminal
Tektronix 1410 (NTSC)
Tektronix 1411 (PAL)
Tektronix 1412 (PAL-M)
Generator
*Color-bar signal
FULL FIELD color-bar
7.5% set up
100 IRE
75% AMPL
BJ board TP 6
Oscilloscope

1. Input color-bar signal to the VIDEO A terminal of the set.
2. Connect an oscilloscope to the TP6 on the BJ board.
3. Adjust RV6 to obtain the waveform on the oscilloscope as shown in Fig. 16-1.

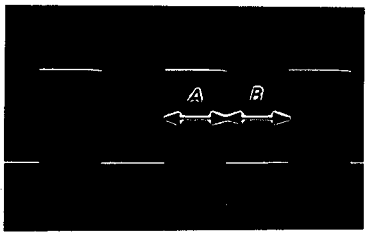
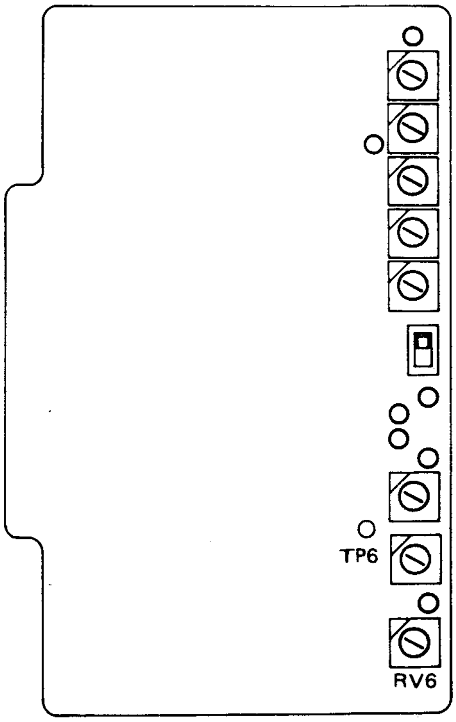
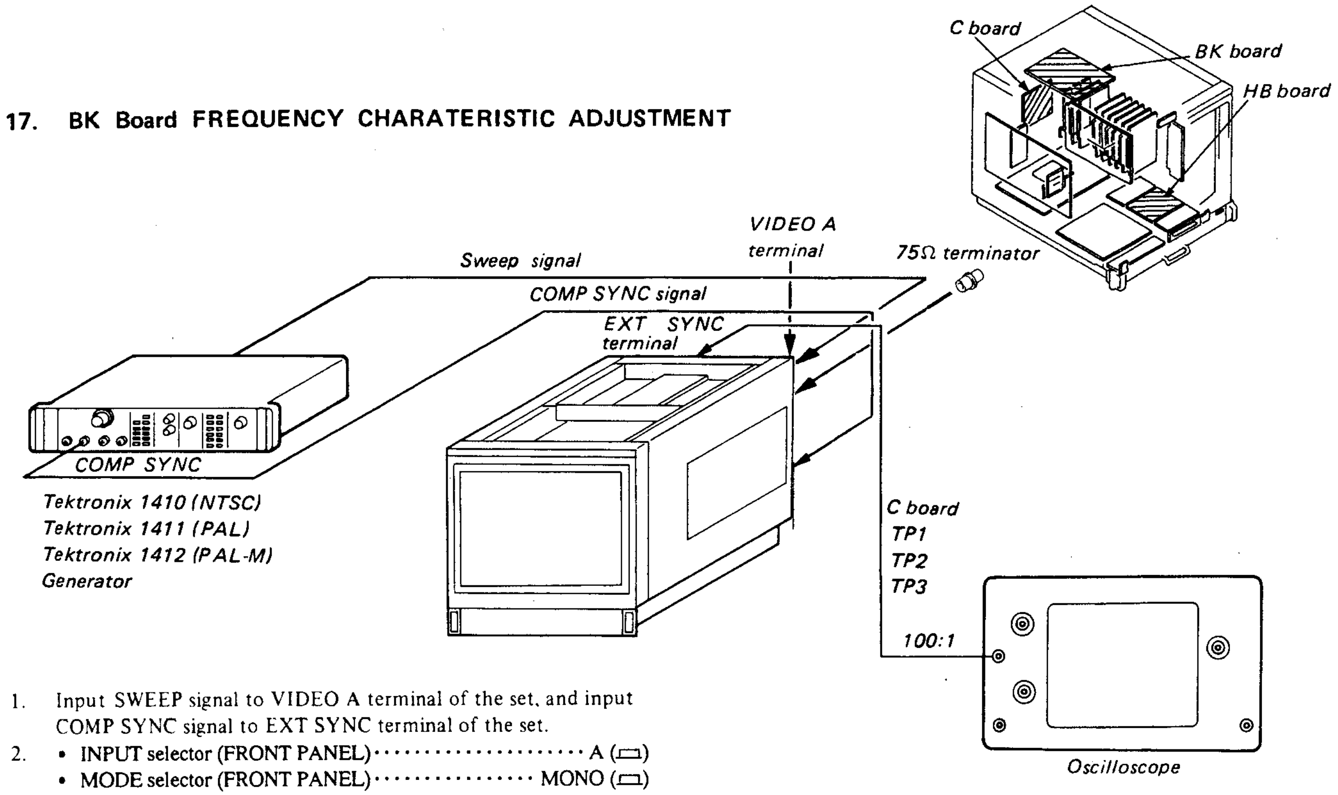


Fig. 16-1

BJ board



17. BK Board FREQUENCY CHARATERISTIC ADJUSTMENT


C board
BK board
HB board
VIDEO A terminal
Sweep signal
75Ω terminator
COMP SYNC signal
EXT SYNC terminal
COMP SYNC
Tektronix 1410 (NTSC)
Tektronix 1411 (PAL)
Tektronix 1412 (PAL-M)
Generator
C board
TP1
TP2
TP3
100:1
Oscilloscope

1. Input SWEEP signal to VIDEO A terminal of the set, and input COMP SYNC signal to EXT SYNC terminal of the set.
2.
   - INPUT selector (FRONT PANEL)······················A (▭)
   - MODE selector (FRONT PANEL)················MONO (▭)
   - FILTER SW (HB board S8) ····························OFF
3. Connect an oscilloscope to the TP1 on the C board.
   *Probe: 100:1
4. Adjust CV101 and RV101 on the BK board so that output waveform becomes flat in a range of 0 to 8MHz as shown in Fig. 17-1.
5. Connect an oscilloscope to the TP2 on the C board.
6. Adjust CV201 and RV201 on the BK board so that output waveform becomes flat in a range of 0 to 8MHz as shown in Fig. 17-1.
7. Connect an oscilloscope to the TP3 on the C board.
8. Adjust CV301 and RV301 on the BK board so that output waveform becomes flat in a range of 0 to 8MHz as shown in Fig. 17-1.

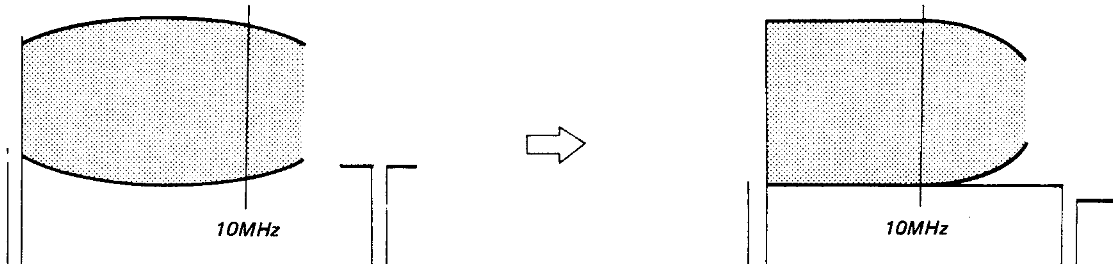
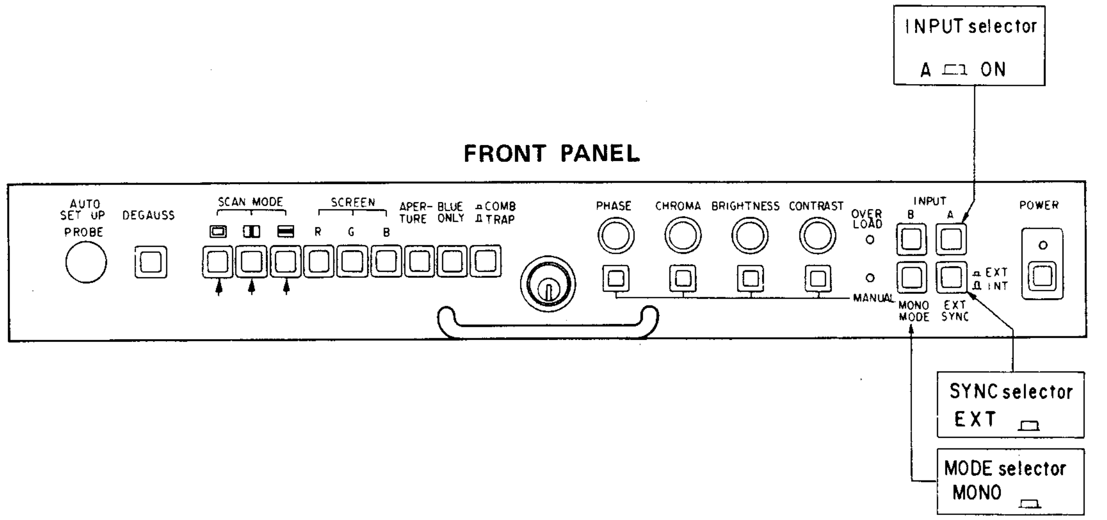
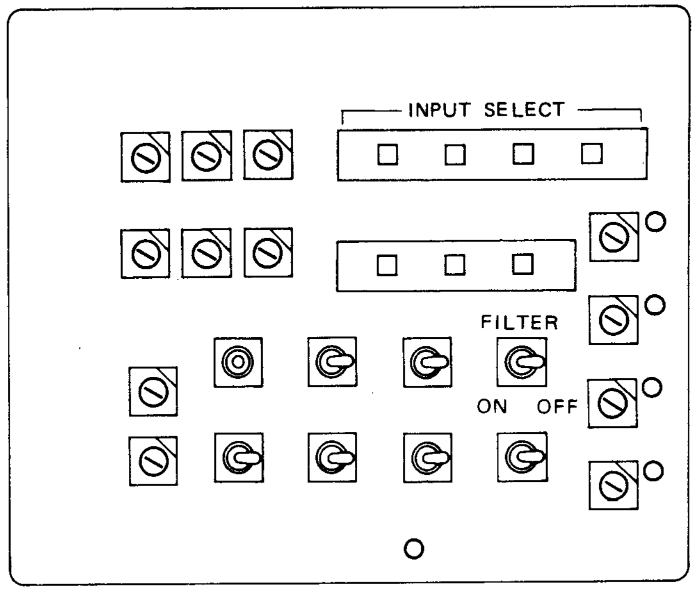

10MHz
10MHz

Fig. 18-1

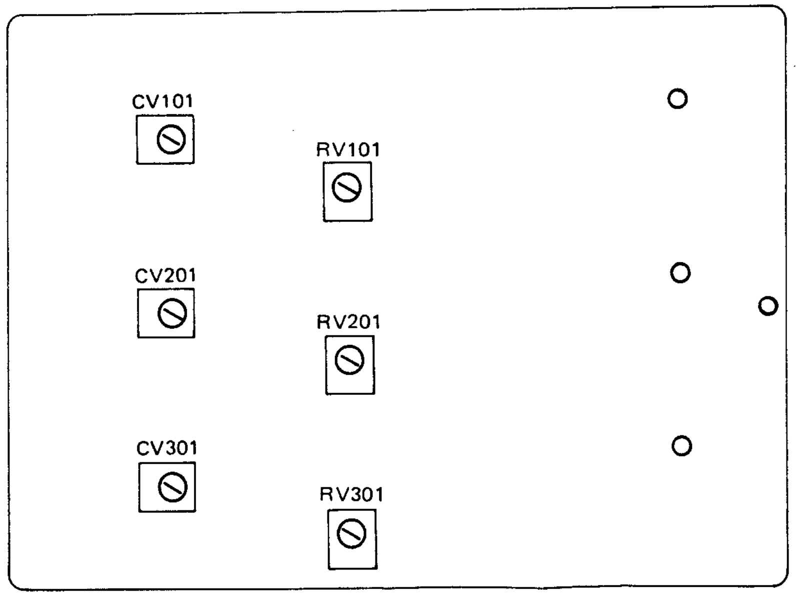
FRONT PANEL


INPUT selector
A ⊏⊐ ON
AUTO SET UP PROBE
DEGAUSS
SCAN MODE
SCREEN
R G B
APER-TURE
BLUE ONLY
COMB TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
INPUT
B A
POWER
EXT
INT
MANUAL
MONO MODE
EXT SYNC
SYNC selector
EXT ▭
MODE selector
MONO ▭

HB board

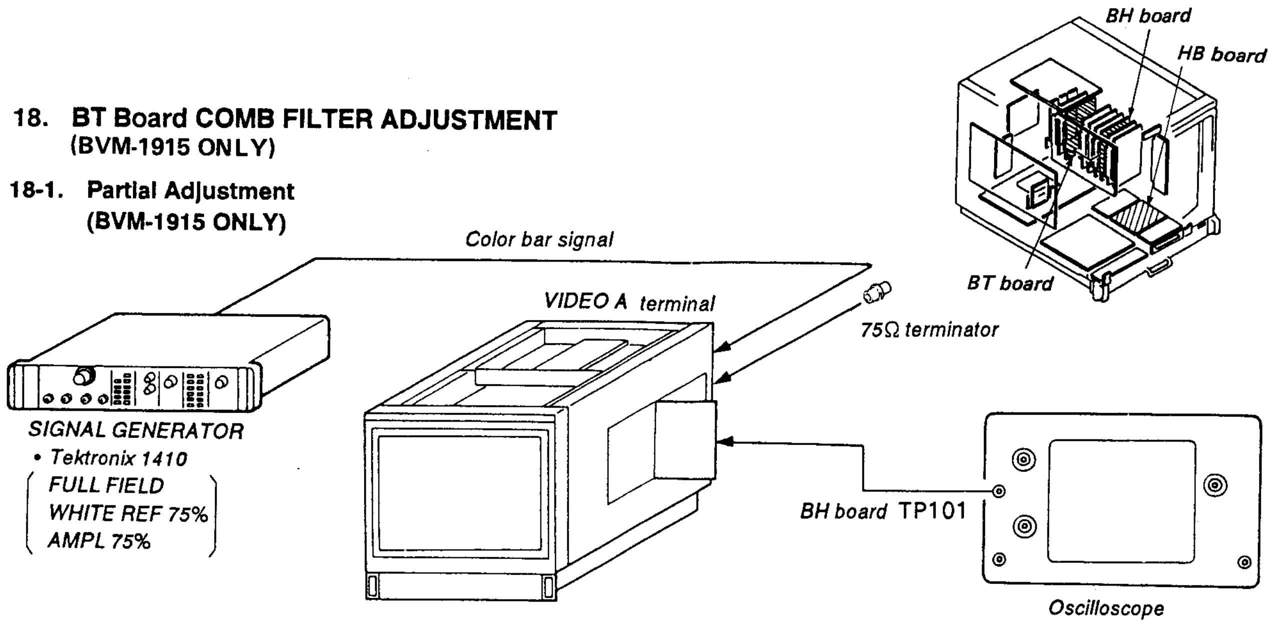

INPUT SELECT
FILTER
ON OFF

BK board


CV101
RV101
CV201
RV201
CV301
RV301

18. BT Board COMB FILTER ADJUSTMENT
(BVM-1915 ONLY)

18-1. Partial Adjustment
(BVM-1915 ONLY)


BH board
HB board
BT board
Color bar signal
VIDEO A terminal
75Ω terminator
SIGNAL GENERATOR
• Tektronix 1410
FULL FIELD
WHITE REF 75%
AMPL 75%
BH board TP101
Oscilloscope

Luminance Level Adjustment

1. Feed a color bar signal to VIDEO A INPUT terminal of this set.
2. Set the COMB/TRAP selector (on the front panel) to TRAP position.
3. Connect the oscilloscope to TP101 (R OUT) on the BH board. (DC 0.1 V/div:H)
4. Turn the POSITION control of the oscilloscope to set the portion A (white) of Fig. 18-1 to the center of the oscilloscope.
5. Set the COMB/TRAP selector on the front panel to the COMB position.
6. Set the COMB D/S (PAL D/S) switch on the sub control panel to S position.
7. Set the portion A (white) of Fig. 18-1 to the center of the oscilloscope using RV3 (luminance level) on the BT board.

Chroma Level Adjustment

1. Feed a color bar signal to VIDEO A INPUT terminal of this set.
2. Set the COMB/TRAP selector (on the front panel) to the TRAP position.
3. Connect the oscilloscope to TP101 on the BH board. (DC 0.1 V/div:H)
4. Turn the POSITION control of the oscilloscope to set the portion A (white) of Fig. 18-1 to the center of the oscilloscope.
5. Set the COMB/TRAP selector to the COMB position.
6. Set the COMB D/S (PAL D/S) switch on the sub control panel to the S position.
7. Set the portion B (red) of Fig. 18-1 to the center of the oscilloscope using RV8 (chroma level) on the BT board.

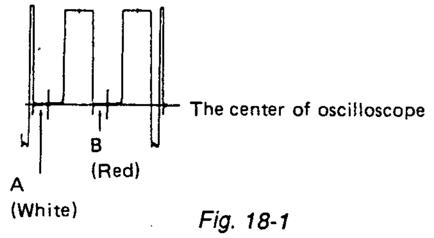
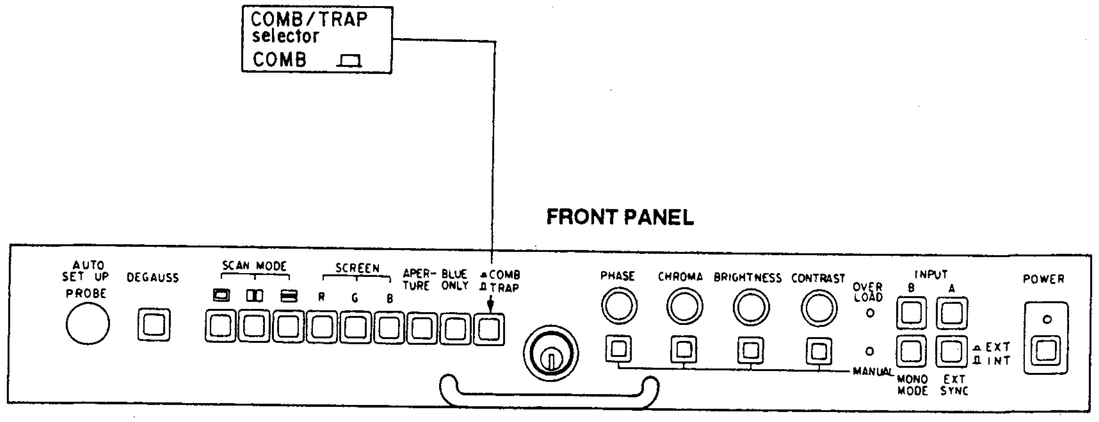
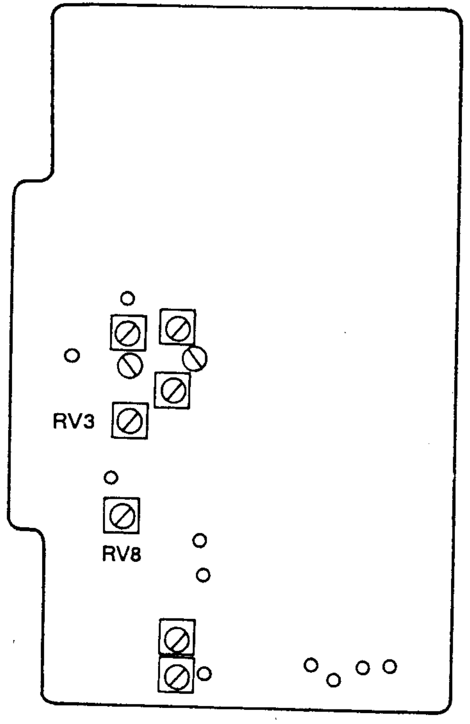

The center of oscilloscope
B
(Red)
A
(White)

Fig. 18-1

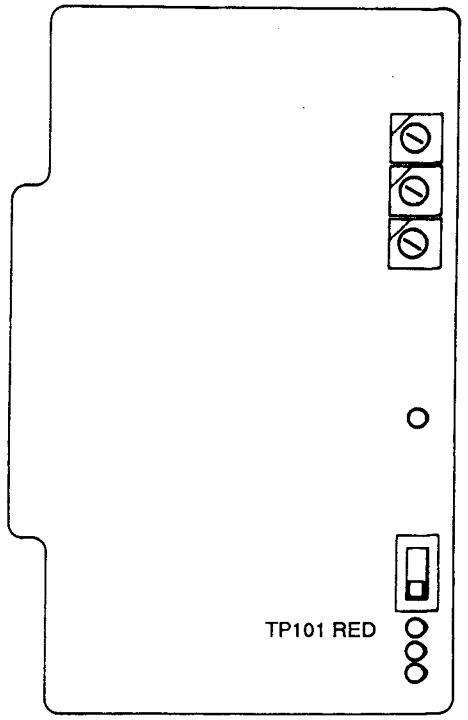
Note: Never attempt to turn the following parts as these cannot be easily adjusted.
FL1, FL2, FL3, DL3, DL5, DL6, DL8


COMB/TRAP selector
COMB ⊓
FRONT PANEL
AUTO SET UP
PROBE
DEGAUSS
SCAN MODE
SCREEN
R G B
APER-TURE
BLUE ONLY
▲COMB
⊓TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
MANUAL
INPUT
B A
▲EXT
⊓INT
MONO MODE
EXT SYNC
POWER

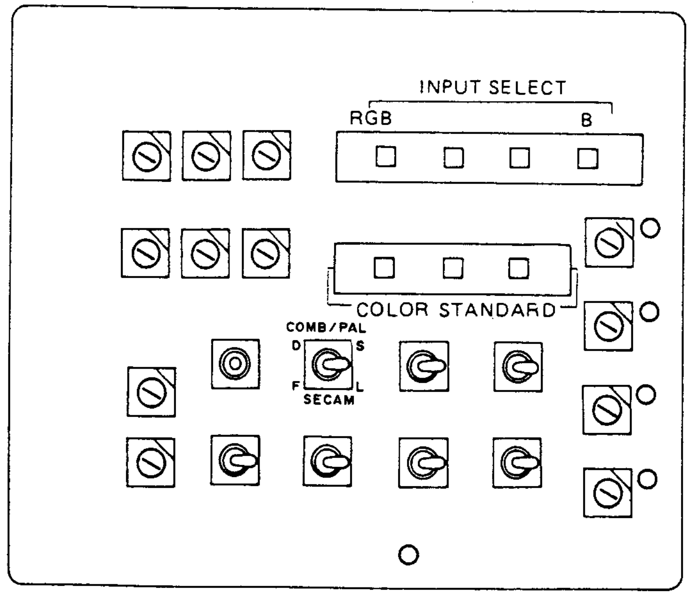
BT board



BH board

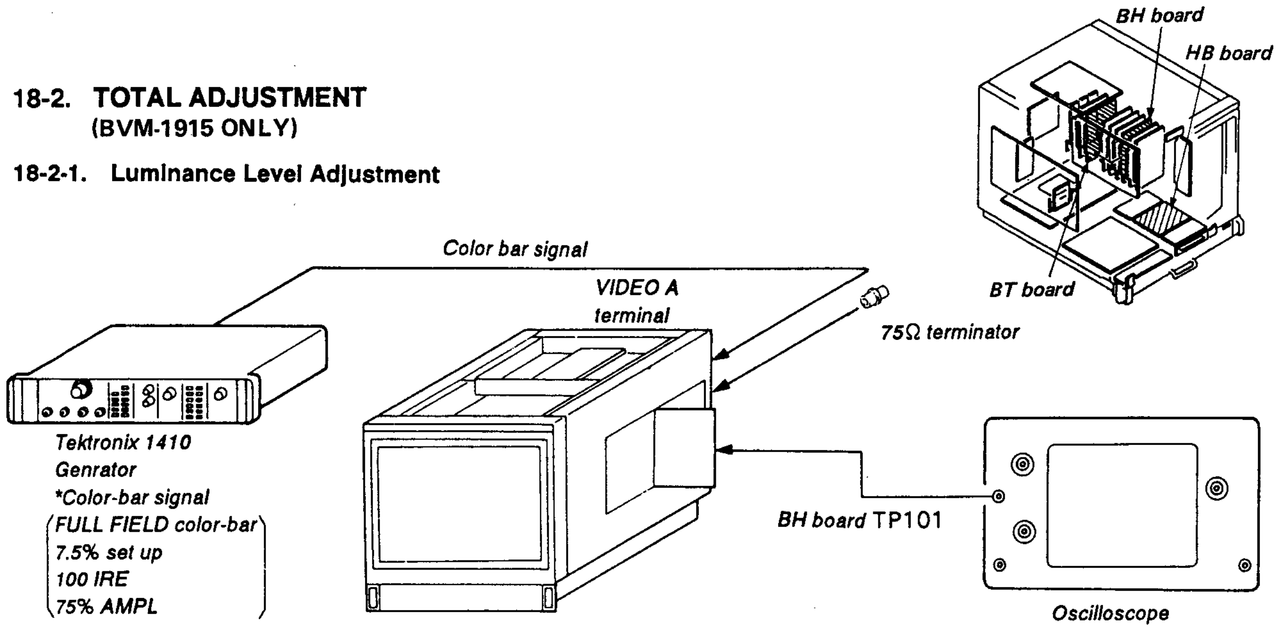


HB board


INPUT SELECT
RGB
B
COLOR STANDARD
COMB/PAL
D
S
F
L
SECAM

18-2. TOTAL ADJUSTMENT
(BVM-1915 ONLY)

18-2-1. Luminance Level Adjustment


BH board
HB board
BT board
Color bar signal
VIDEO A terminal
75Ω terminator
Tektronix 1410
Genrator
*Color-bar signal
FULL FIELD color-bar
7.5% set up
100 IRE
75% AMPL
BH board TP101
Oscilloscope

1. Feed a color bar signal to VIDEO A INPUT terminal of this set.
2. Set the COMB/TRAP selector on the front panel to the TRAP position.
3. Connect the oscilloscope to TP101 (R OUT) on the BH board. (DC 0.1 V/div:H)
4. Turn the POSITION control of the oscilloscope until the portion A (white) of Fig. 18-2 is set to the center of the oscilloscope.
5. Set the COMB/TRAP selector to the COMB position.
6. Set the COMB D/S (PAL D/S) switch on the sub control panel to the S position.
7. Set the portion A (white) of Fig. 18-2 to the center of the oscilloscope using RV3 (luminance level) on the BT board.
8. Set the COMB D/S switch to the D position.
9. Set the portion A (white) of Fig. 18-2 to the center of the oscilloscope using RV9 (1H luminance level) on the BT board.

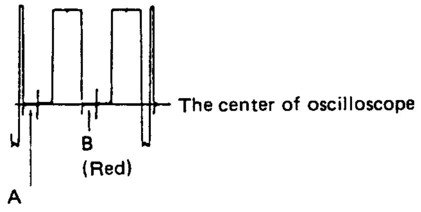
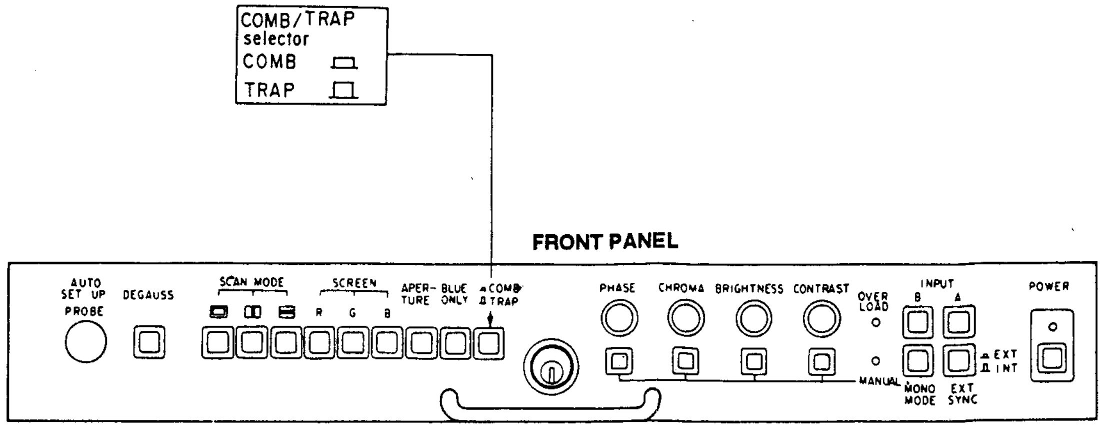
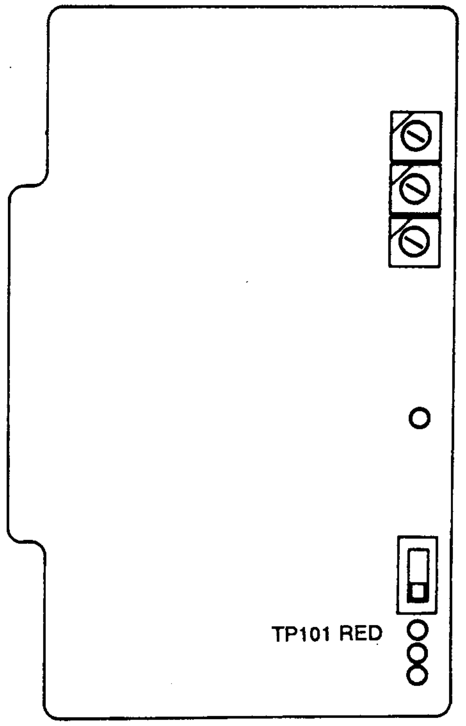

The center of oscilloscope
B
(Red)
A
(White)

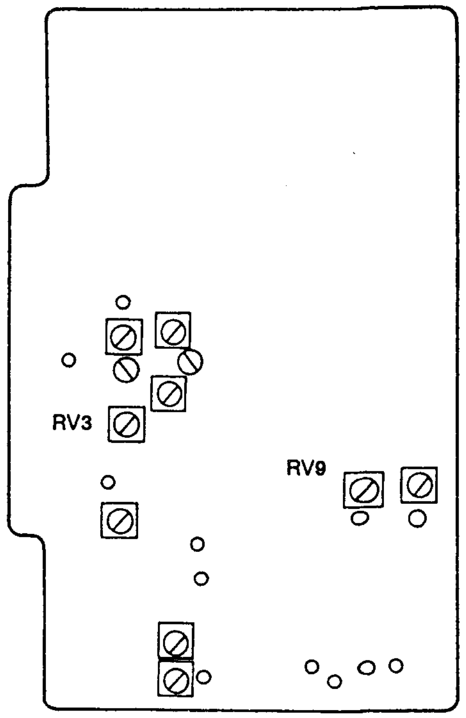
Fig. 18-2


COMB/TRAP selector
COMB
TRAP
FRONT PANEL
AUTO SET UP
PROBE
DEGAUSS
SCAN MODE
SCREEN
R G B
APER-TURE
BLUE ONLY
COMB
TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
MANUAL
INPUT
B A
MONO MODE
EXT SYNC
EXT
INT
POWER

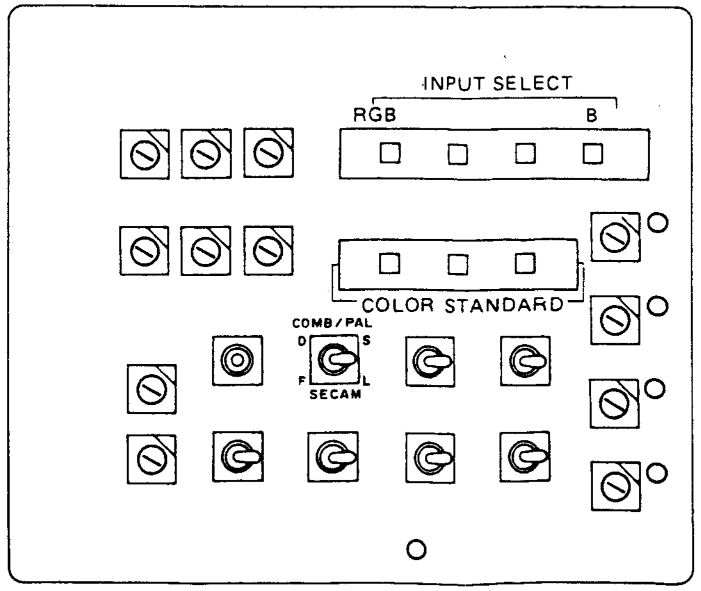
BH board



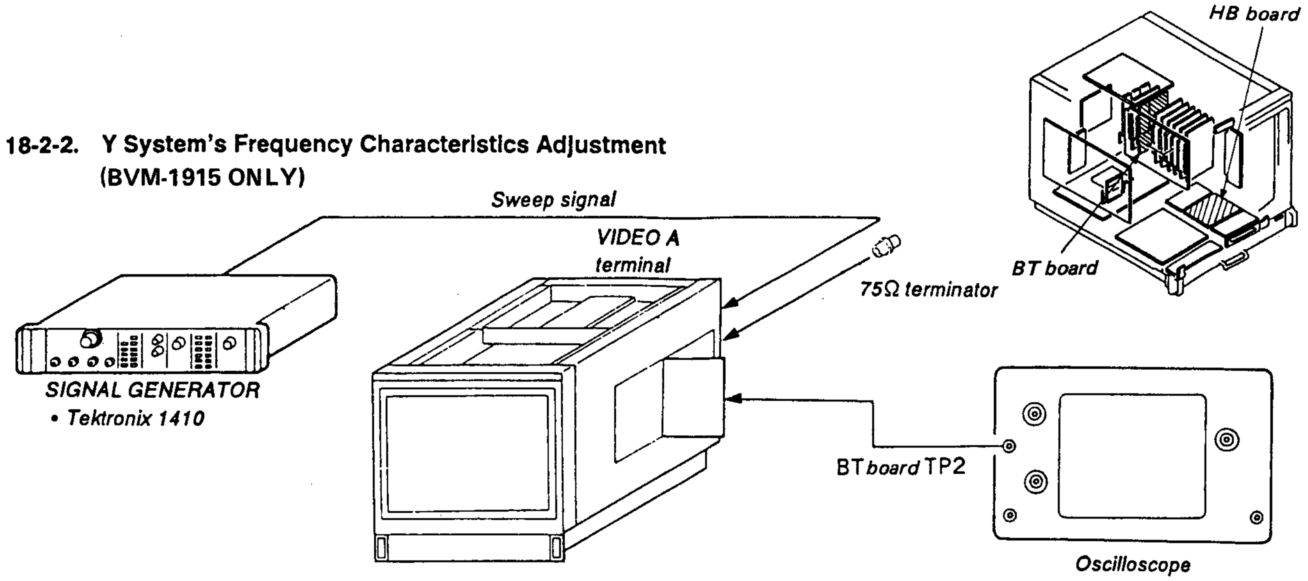
BT board



HB board


INPUT SELECT
RGB
B
COLOR STANDARD
COMB/PAL
D
S
F
L
SECAM

18-2-2. Y System's Frequency Characteristics Adjustment (BVM-1915 ONLY)


HB board
Sweep signal
VIDEO A terminal
75Ω terminator
BT board
SIGNAL GENERATOR
• Tektronix 1410
BT board TP2
Oscilloscope

1. Feed a sweep signal to the VIDEO A INPUT terminal of this set.
2. Set the COMB/TRAP selector on the front panel to the COMB position.
3. Connect the oscilloscope to TP2 on the BT board. (AC 0.1 V/div:V)
4. Set CV5 to the position as shown in Fig. 18-3.
5. Set the COMB D/S (PAL D/S) switch on the sub control panel to the S position.
6. Adjust the frequency characteristics until it is made flat using CV1 (Y FREQ) on the BT board. If it cannot be properly adjusted by using CV1, use CV5 (Y FREQ).
7. Set the COMB D/S switch to the D position.
8. Adjust the frequency characteristics until it is made flat using CV2 (1H Y FREQ) on the BT board.
9. Set CV3 (CLK PHASE) and CV4 (CLK PHASE) on the BT board to the position as shown in Fig. 18-4.
10. Adjust the clock phase until it becomes just as shown in Fig. 18-5 using CV3.
11. If it cannot be adjusted with CV3, adjust with CV4 by returning CV3 to the position of Fig. 18-4.

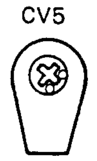


Fig. 18-3

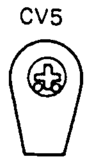


Fig. 18-4

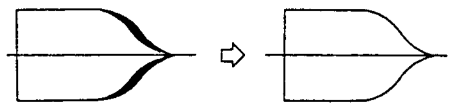
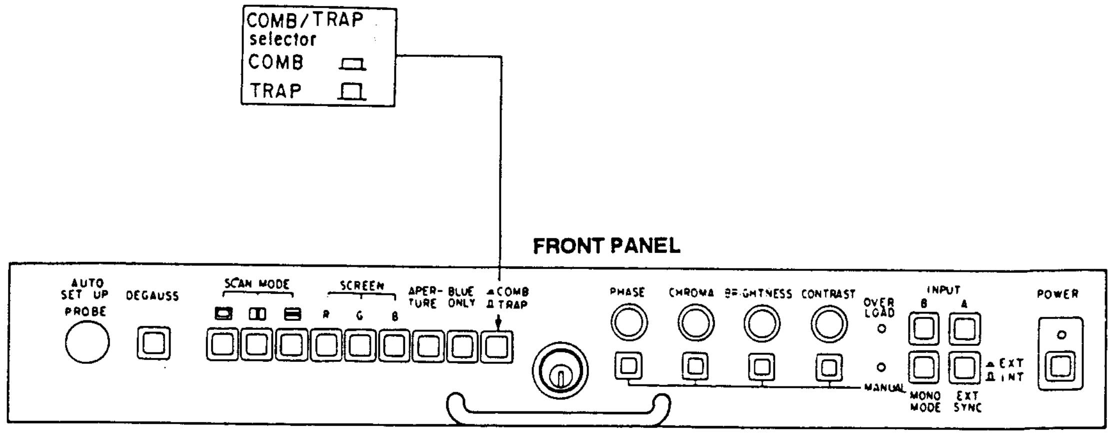
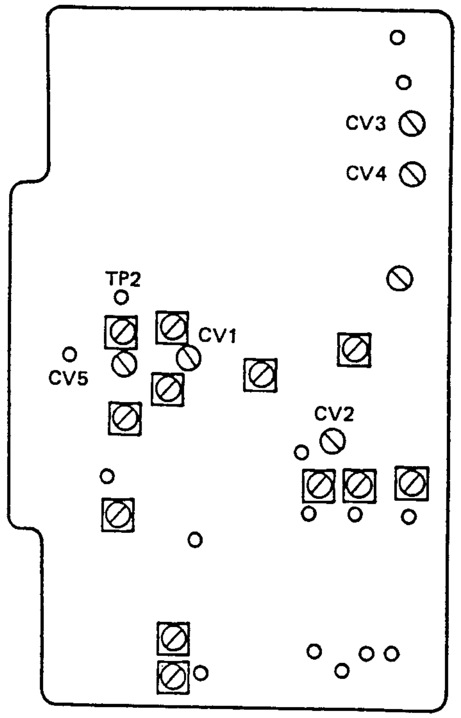


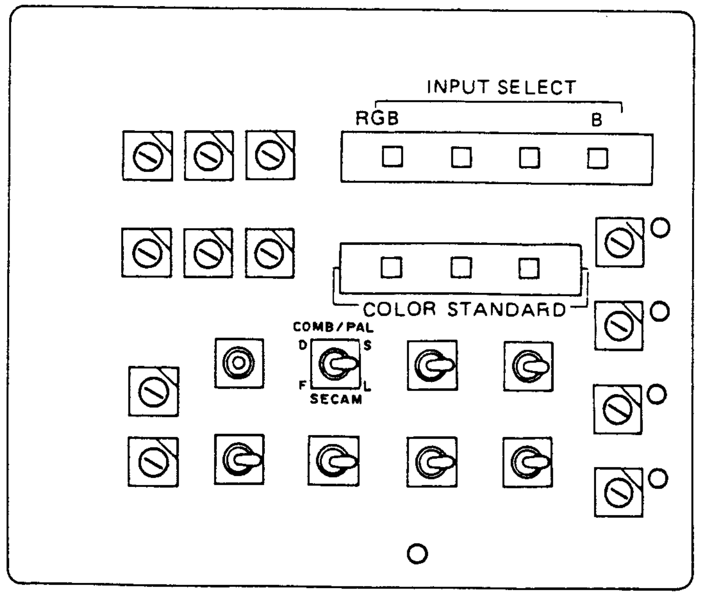
Fig. 18-5


COMB/TRAP selector
COMB
TRAP
FRONT PANEL
AUTO SET UP PROBE
DEGAUSS
SCAN MODE
SCREEN
R
G
B
APER-TURE
BLUE ONLY
COMB
TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
INPUT
B
A
EXT
INT
MANUAL
MONO MODE
EXT SYNC
POWER

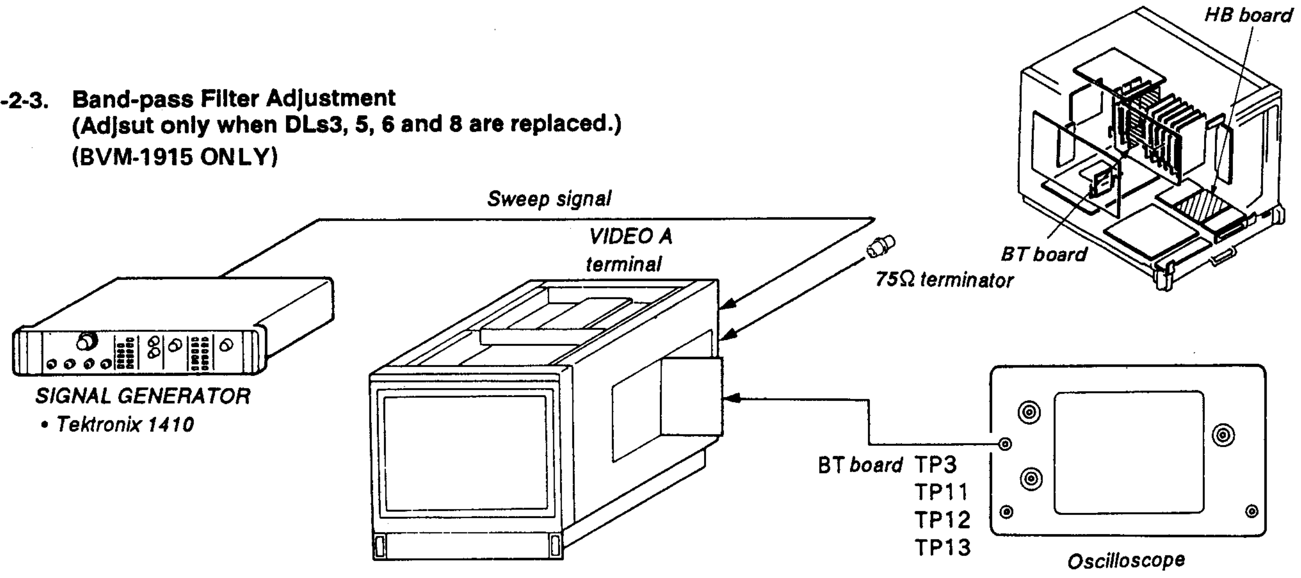
BT board


CV3
CV4
TP2
CV1
CV5
CV2

HB board


INPUT SELECT
RGB
B
COLOR STANDARD
COMB/PAL
D
S
F
L
SECAM

18-2-3. Band-pass Filter Adjustment
(Adjsut only when DLs3, 5, 6 and 8 are replaced.)
(BVM-1915 ONLY)



HB board
Sweep signal
VIDEO A terminal
75Ω terminator
BT board
SIGNAL GENERATOR
• Tektronix 1410
BT board TP3
TP11
TP12
TP13
Oscilloscope

1. Feed a sweep signal to the VIDEO A INPUT terminal of this set.
2. Set the COMB D/S (PAL D/S) switch on the front panel to the S position.
3. Connect the oscilloscope to TP11.
4. Adjust the frequency characteristics using DL3 on the BT board so that the waveform becomes symmetrical as shown in Fig. 18-6 with 3.58 MHz as center frequency.
5. Connect the oscilloscope to TP12.
6. Adjust the frequency characteristics using DL6 on the BT board so that the waveform becomes symmetrical as shown in Fig. 18-6 with 3.58 MHz as center frequency.
7. Connect the oscilloscope to TP13.
8. Adjust the frequency characteristics using DL8 on the BT board so that the waveforms becomes symmetrical as shown in Fig. 18-6 with 3.58 MHz as center frequency.
9. Connect the oscilloscope to TP3.
10. Adjust the frequency characteristics using DL5 on the BT board so that the waveforms becomes symmetrical as shown in Fig. 18-6 with 3.58 MHz as center frequency.

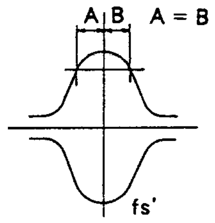
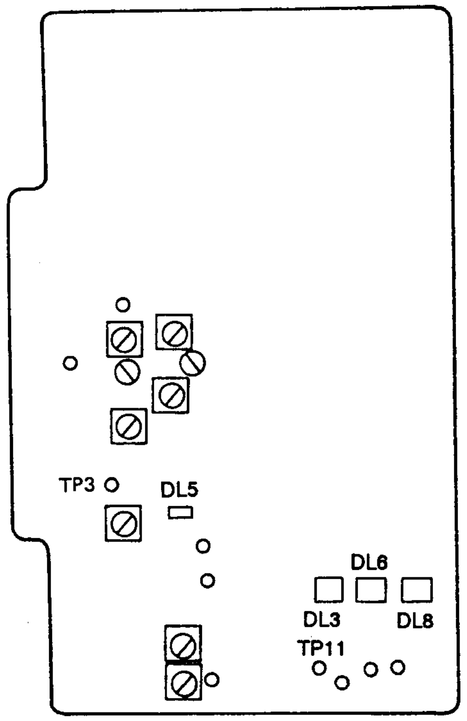


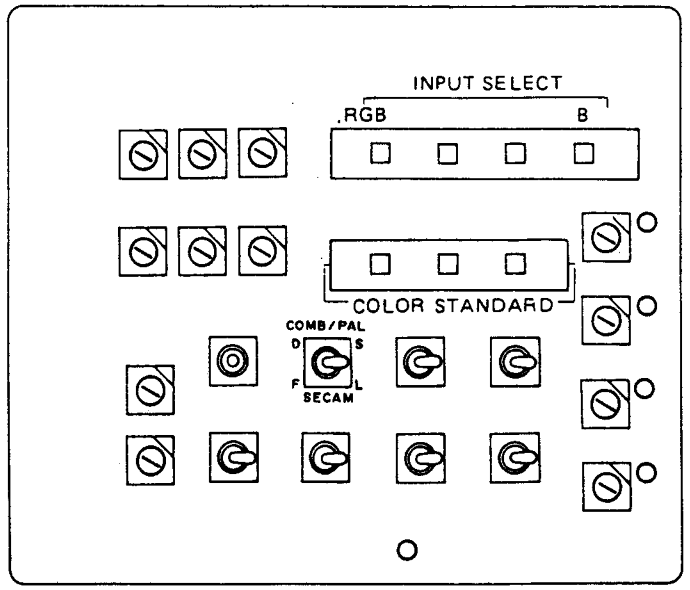
Fig. 18-6

BT board



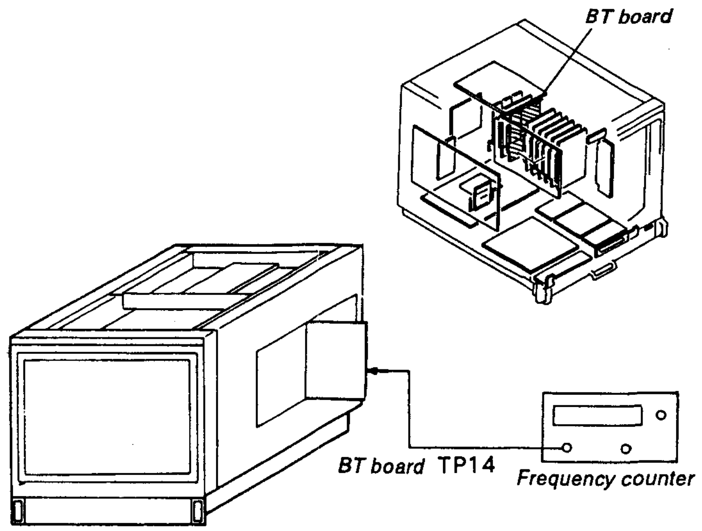
TP3
DL5
DL6
DL3
DL8
TP11

HB board



INPUT SELECT
RGB
B
COLOR STANDARD
COMB/PAL
D
S
F
L
SECAM

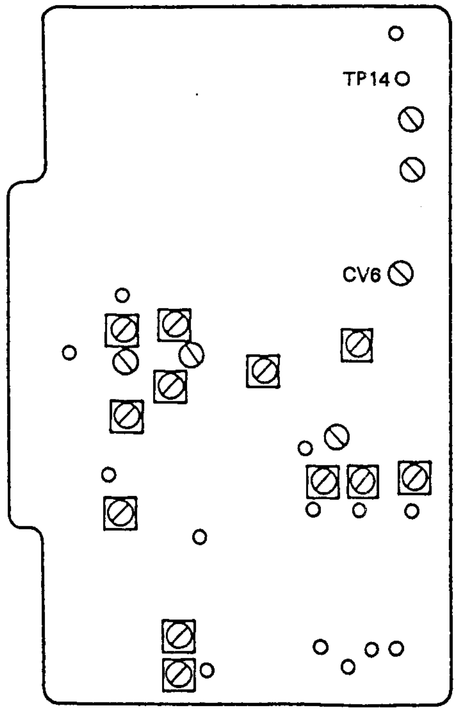
18-2-4. Clock fo Adjustment
(BVM-1915 ONLY)



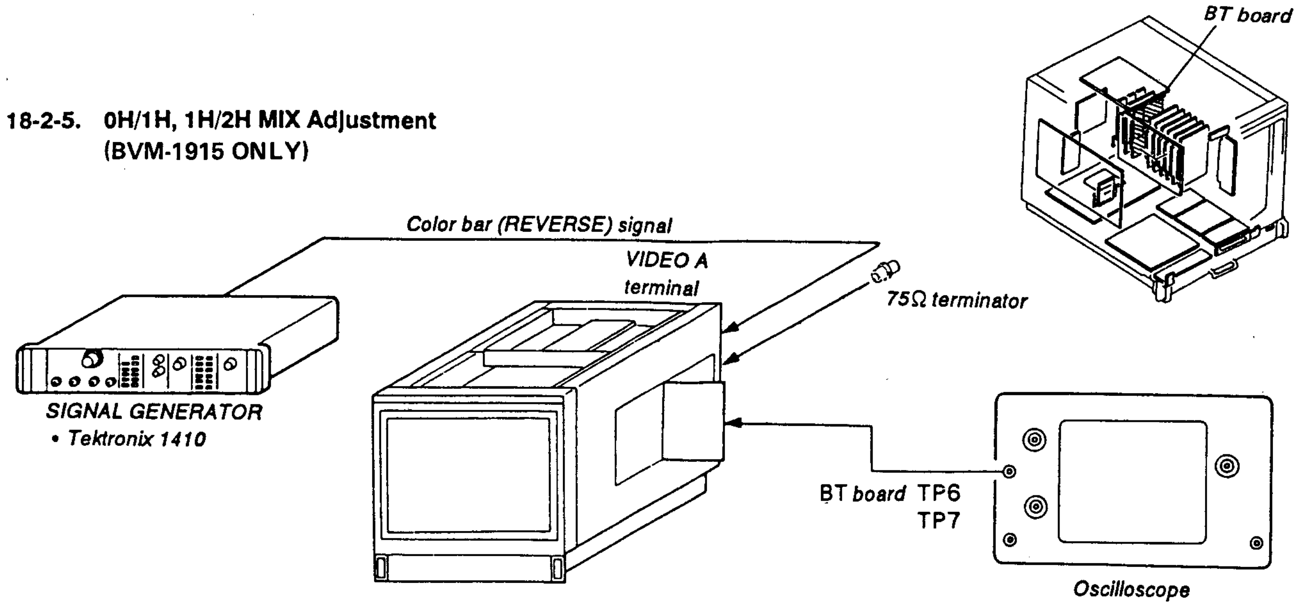
BT board
BT board TP14
Frequency counter

1. Connect the frequency counter to TP14.
2. Make adjustment as shown below using CV6 (CLK FREQ) on the BT board.
   - fo=21.477 MHz

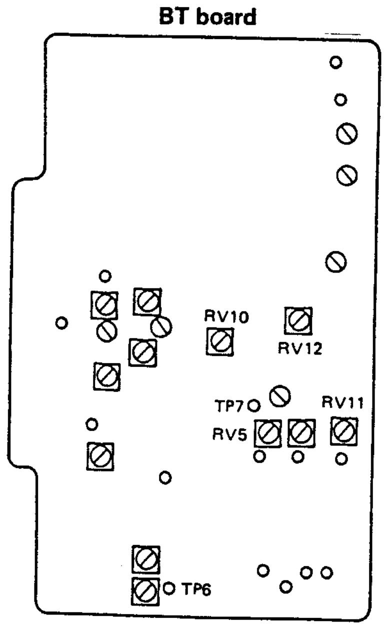
BT board



18-2-5. 0H/1H, 1H/2H MIX Adjustment
(BVM-1915 ONLY)


BT board
Color bar (REVERSE) signal
VIDEO A terminal
75Ω terminator
SIGNAL GENERATOR
• Tektronix 1410
BT board TP6
TP7
Oscilloscope

1. Feed a color bar signal (REVERSE) to the VIDEO A INPUT terminal of this set.
2. Connect the oscilloscope to TP6 to magnify the signal inverted area.
3. Turn RV5 (0H/1H MIX LEVEL) and RV10 (0H/1H MIX PHASE) on the BT board until the portion shown in Fig. 18-7 is reduced to a minimum.
4. Connect the oscilloscope to TP7.
5. Turn RV12 (1H/2H MIX PHASE) and RV11 (1H/2H MIX LEVEL) on the BT board until the portion shown in Fig. 18-7 is reduced to a minimum.


BT board
RV10
RV12
TP7
RV11
RV5
TP6

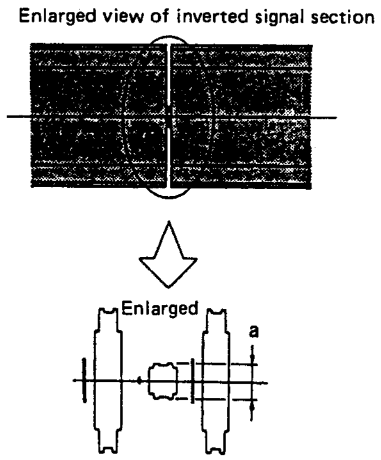
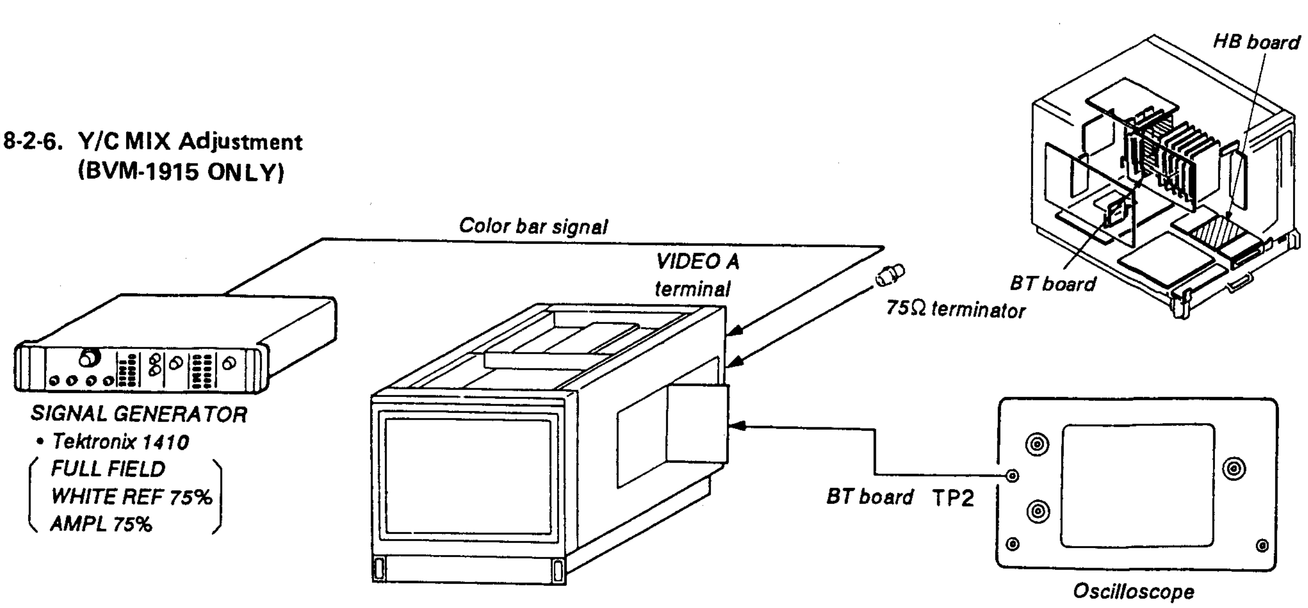

Enlarged view of inverted signal section
Enlarged
a

Fig. 18-7

18-2-6. Y/C MIX Adjustment
(BVM-1915 ONLY)


HB board
Color bar signal
VIDEO A terminal
75Ω terminator
BT board
SIGNAL GENERATOR
• Tektronix 1410
FULL FIELD
WHITE REF 75%
AMPL 75%
BT board TP2
Oscilloscope

1. Feed a color bar signal to the VIDEO A INPUT terminal of this set.
2. Connect the oscilloscope to TP2 on the BT board.
3. Set the COMB D/S (PAL D/S) switch on the sub control panel to the D position.
4. Turn RV1 (Y/C MIX PHASE) and RV2 (Y/C MIX LEVEL) on the BT board so that the sub-carrier level is reduced to a minimum as shown in Fig. 18-8.

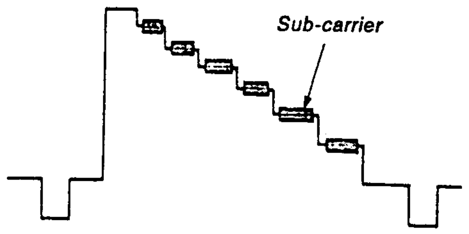
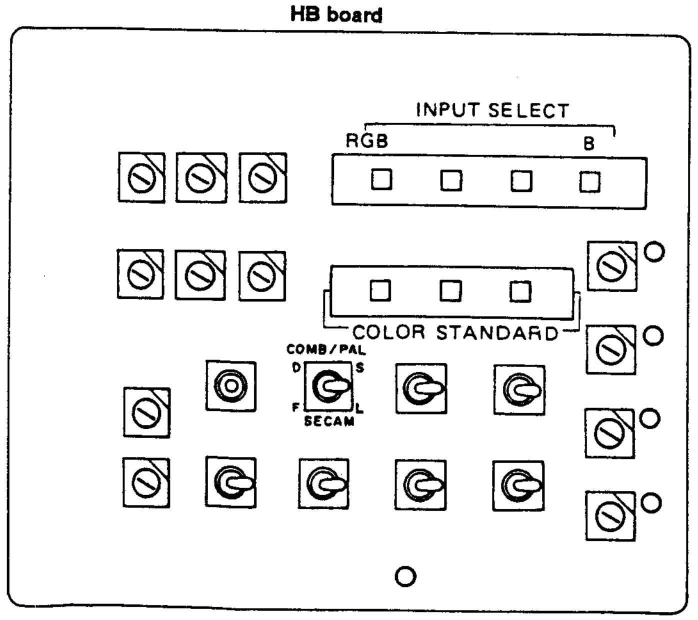
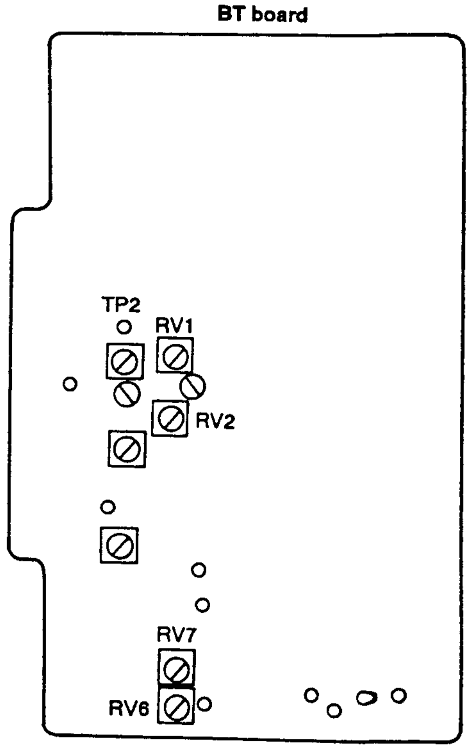

Sub-carrier

Fig. 18-8

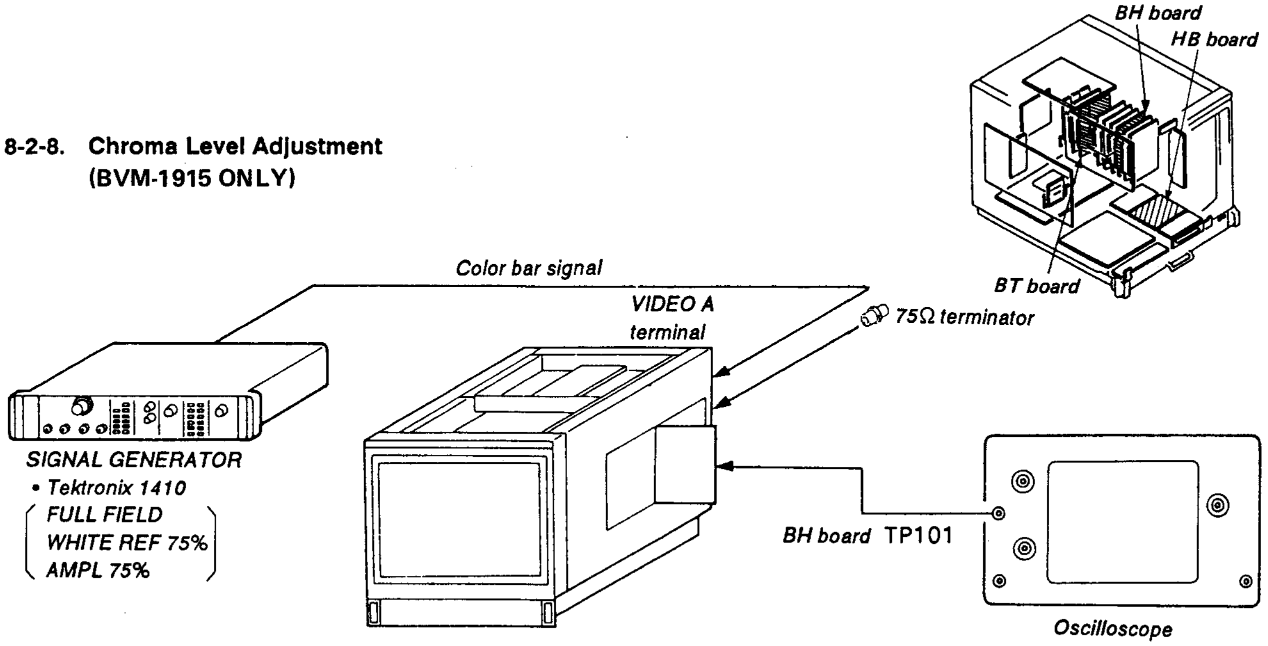

HB board
INPUT SELECT
RGB
B
COLOR STANDARD
COMB/PAL
D
S
F
L
SECAM

18-2-7. S COMB Adjustment
(BVM-1915 ONLY)

1. Feed a color bar signal to the VIDEO A INPUT terminal of this set.
2. Set the COMB D/S (PAL D/S) switch on the sub control panel to the S position.
3. Connect the oscilloscope to TP2 on the BT board.
4. Turn RV6 (S COMB C Level) and RV7 (S COMB C PHASE) on the BT board so that the sub-carrier level is reduced to a minimum as shown in Fig. 18-8.


BT board
TP2
RV1
RV2
RV7
RV6

18-2-8. Chroma Level Adjustment (BVM-1915 ONLY)


BH board
HB board
BT board
Color bar signal
VIDEO A terminal
75Ω terminator
SIGNAL GENERATOR
• Tektronix 1410
FULL FIELD
WHITE REF 75%
AMPL 75%
BH board TP101
Oscilloscope

1. Feed a color bar signal to the VIDEO A INPUT terminal of this set.
2. Set the COMB/TRAP selector on the front panel to the TRAP position.
3. Connect the oscilloscope to TP101 on the BH board. (DC 0.1 V/div:H)
4. Turn the POSITION control of the oscilloscope to set the portion B (red) of Fig. 18-9 to the center of the oscilloscope.
5. Set the COMB/TRAP selector to the COMB position.
6. Set the COMB D/S (PAL D/S) switch on the sub control panel to the S position.
7. Set the portion B (red) of Fig. 18-9 to the center of the oscilloscope using RV8 (C OUTPUT LEVEL) on the BT board.

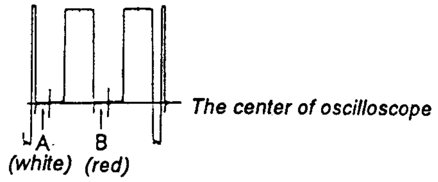
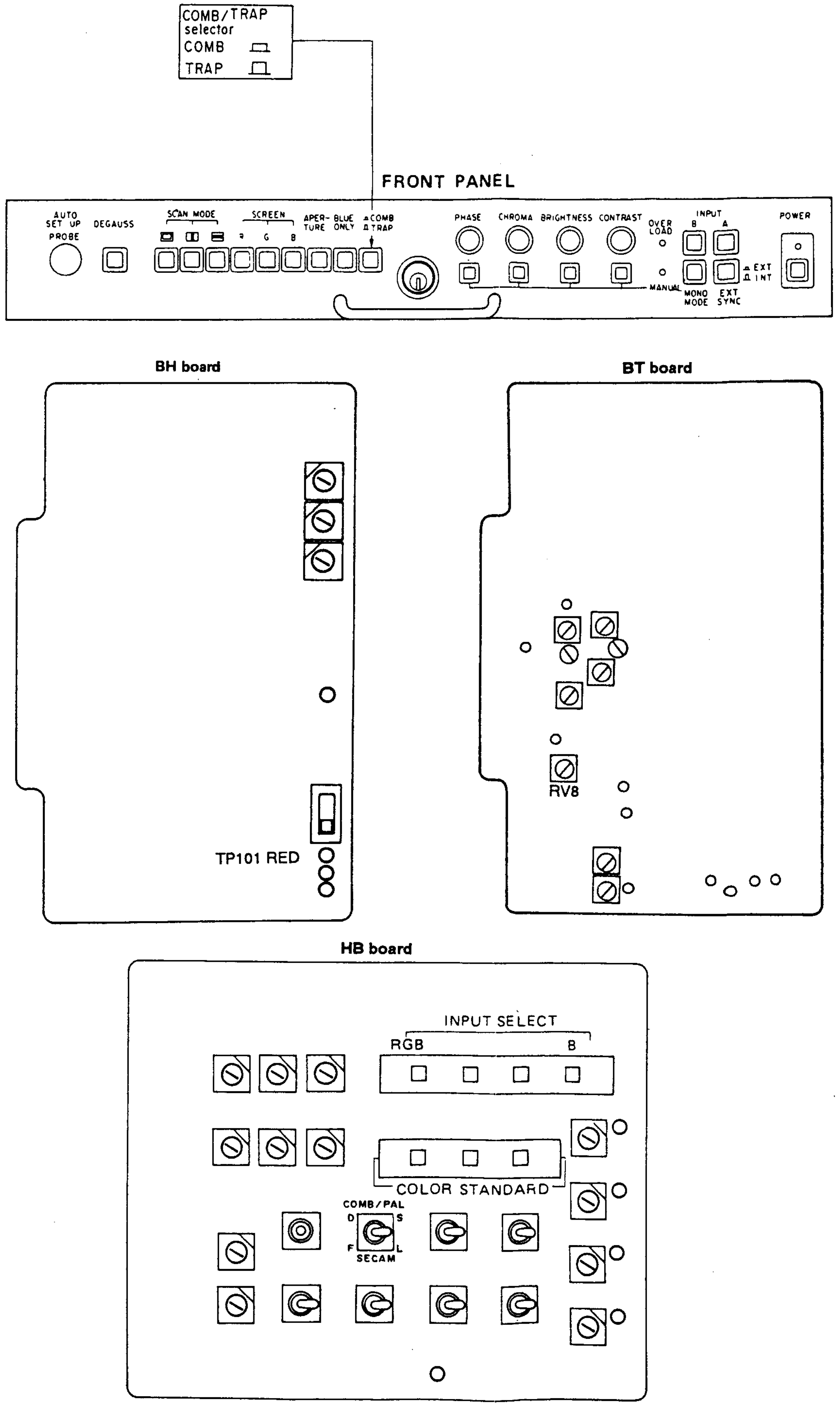
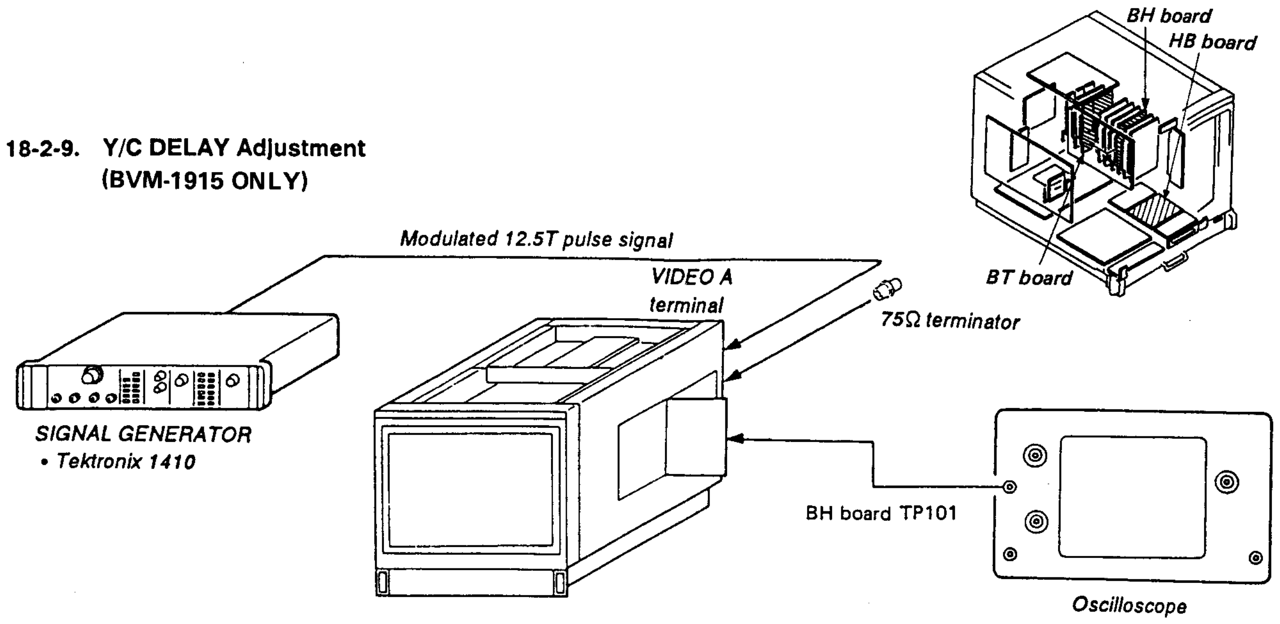

The center of oscilloscope
A
(white)
B
(red)

Fig. 18-9


COMB/TRAP
selector
COMB
TRAP
FRONT PANEL
AUTO
SET UP
PROBE
DEGAUSS
SCAN MODE
SCREEN
R G B
APER-
TURE
BLUE
ONLY
COMB
TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER
LOAD
INPUT
B
A
POWER
MANUAL
MONO
MODE
EXT
SYNC
EXT
INT
BH board
TP101 RED
BT board
RV8
HB board
INPUT SELECT
RGB
B
COLOR STANDARD
COMB/PAL
D
S
F
L
SECAM

18-2-9. Y/C DELAY Adjustment (BVM-1915 ONLY)


BH board
HB board
BT board
Modulated 12.5T pulse signal
VIDEO A terminal
75Ω terminator
SIGNAL GENERATOR
• Tektronix 1410
BH board TP101
Oscilloscope

1. Feed a 12.5T pulse signal to the VIDEO A terminal of this set.
2. Set the COMB D/S switch to the S position.
3. Connect the oscilloscope to TP101 on the BH board.
4. Turn the CHROMA MANUAL control (on the front panel) until the chroma signal is adjusted as shown in Fig. 18-10.
5. After adjustment, turn RV4 (Y/C DELAY) on the BT board until the waveform is symmetrical.

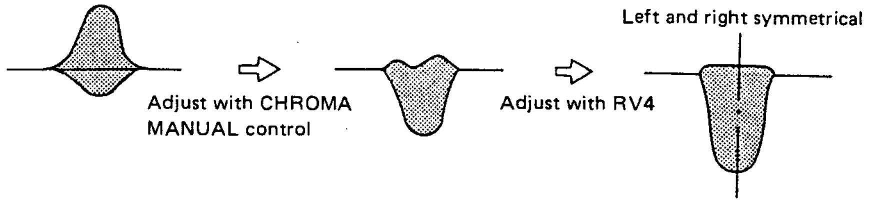
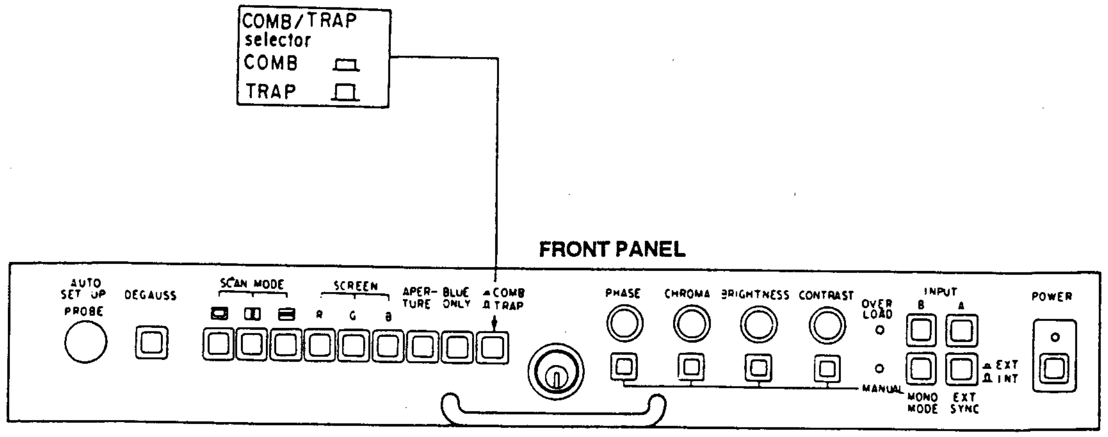
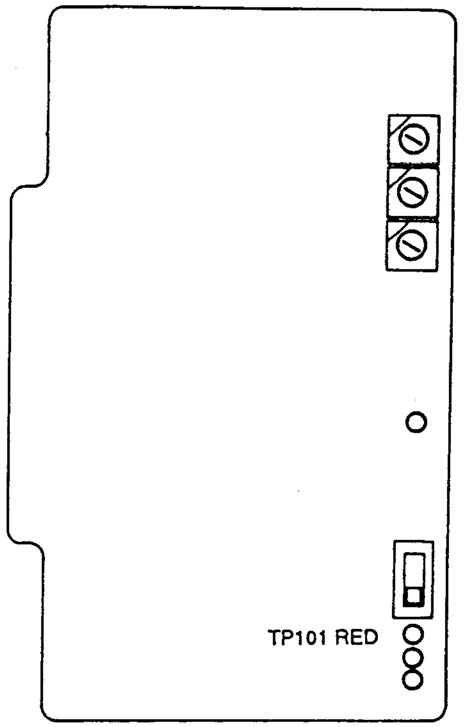

Left and right symmetrical
Adjust with CHROMA MANUAL control
Adjust with RV4

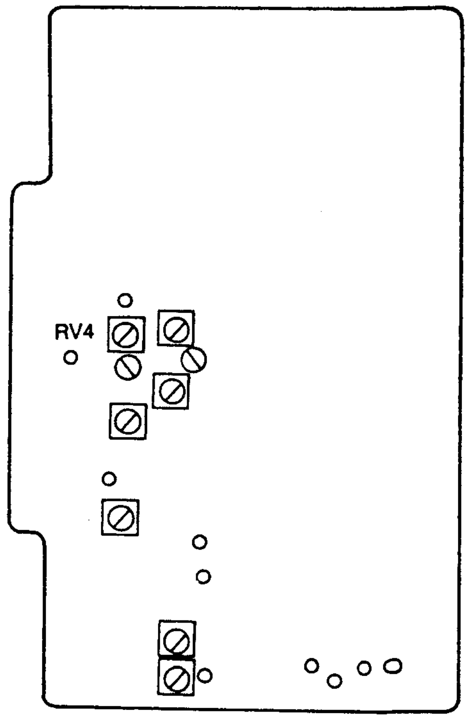
Fig. 18-10


COMB/TRAP selector
COMB
TRAP
FRONT PANEL
AUTO SET UP
PROBE
DEGAUSS
SCAN MODE
SCREEN
R
G
B
APER-TURE
BLUE ONLY
COMB
TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
MANUAL
INPUT
B
A
EXT
INT
MONO MODE
EXT SYNC
POWER

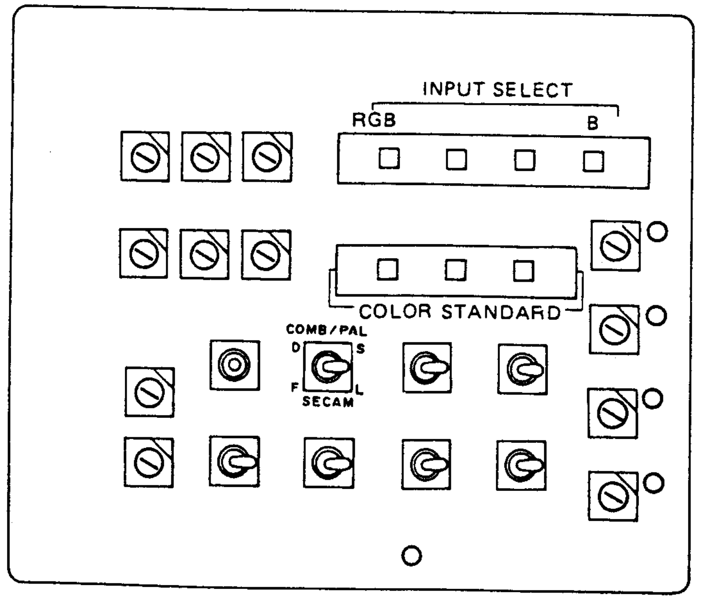
BH board



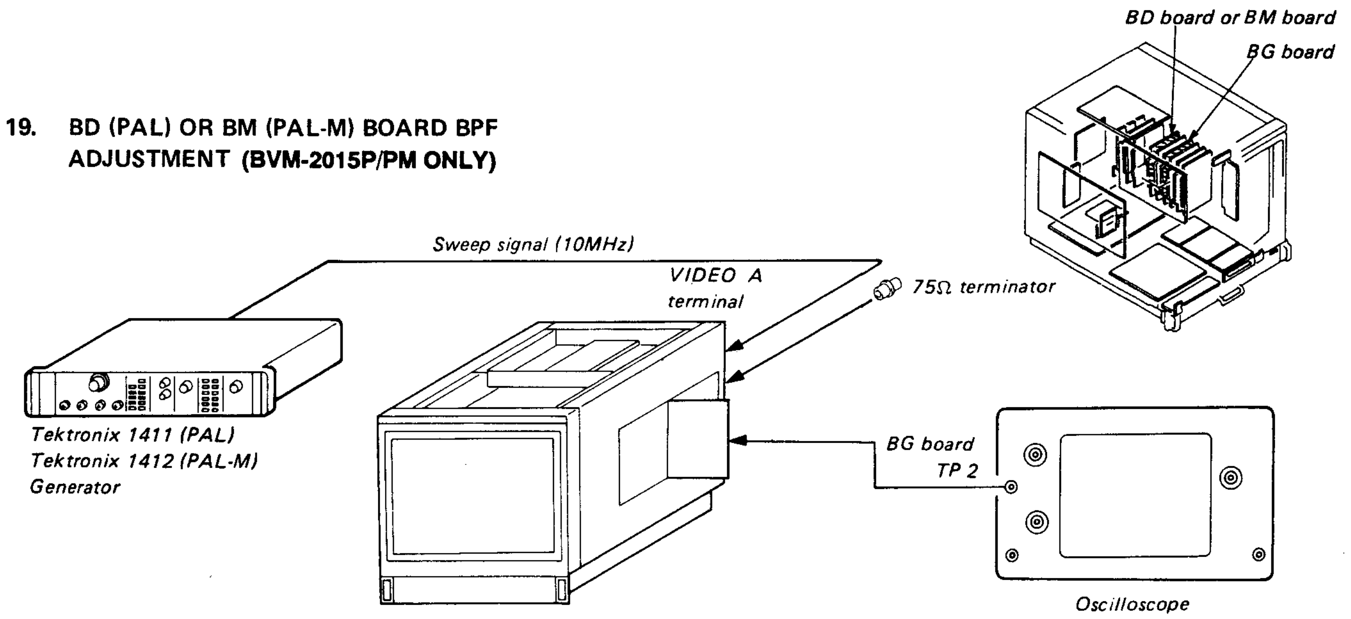
BT board



HB board


INPUT SELECT
RGB
B
COLOR STANDARD
COMB/PAL
D
S
F
L
SECAM

19. BD (PAL) OR BM (PAL-M) BOARD BPF ADJUSTMENT (BVM-2015P/PM ONLY)


BD board or BM board
BG board
Sweep signal (10MHz)
VIDEO A terminal
75Ω terminator
BG board TP 2
Tektronix 1411 (PAL)
Tektronix 1412 (PAL-M)
Generator
Oscilloscope

- * Set the PAL switch (sub control panel) of the BVM-2015P or 2015PM to the S position.

1. Input SWEEP signal (10MHz) to the VIDEO A terminal of the set.
2. Connect an oscilloscope to the TP2 on the BG board.
3. Make the V/div of oscilloscope into VARIABLE, and match the upper section of waveform to 7 div as shown in Fig. 19-1.

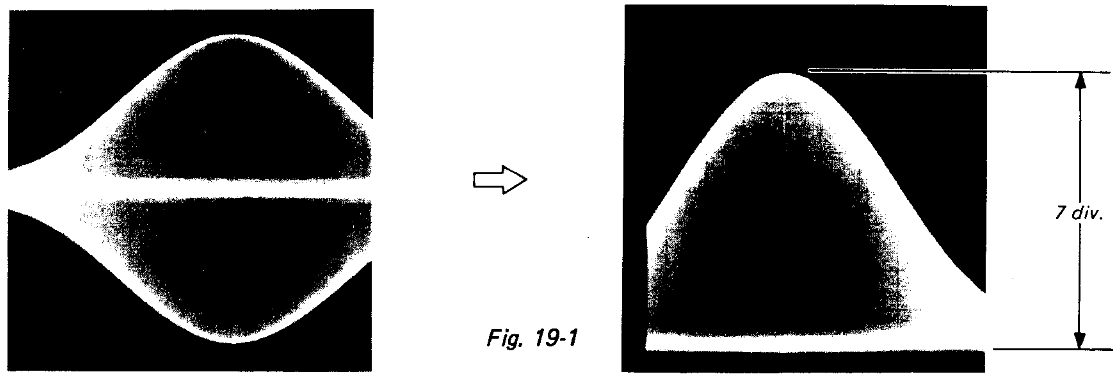
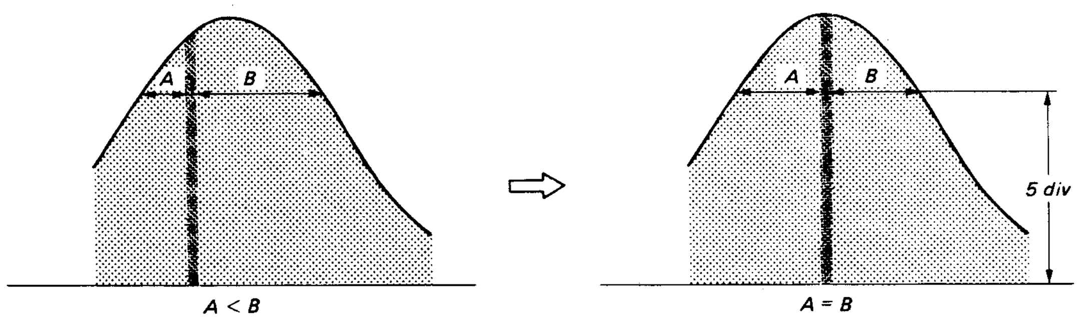


Fig. 19-1

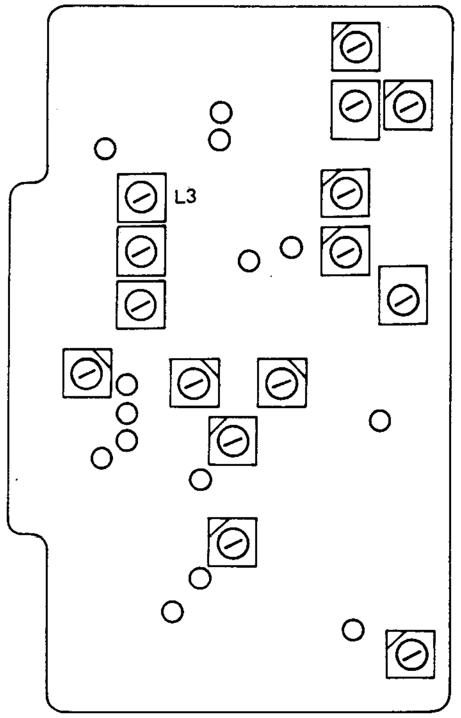
4. Adjust L3 on the BD or BM board so that A is equal to B as shown in Fig. 19-2.


A
B
A < B
A
B
5 div
A = B

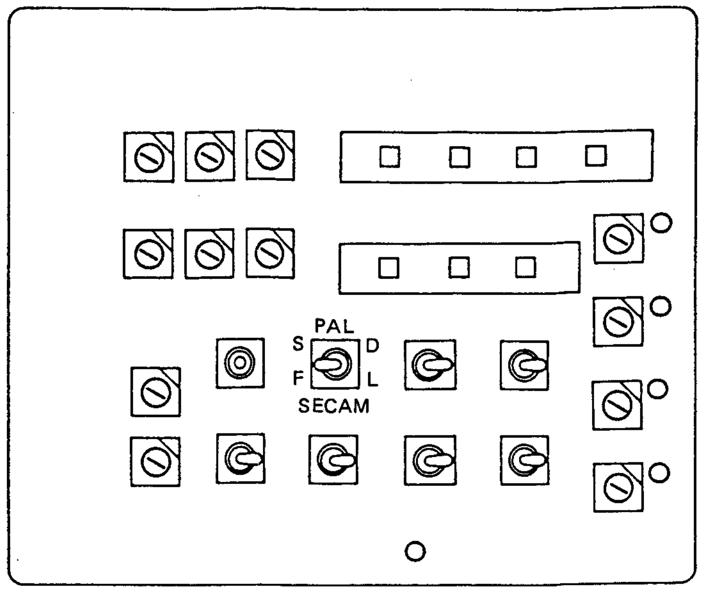
A is equal to B when the amplitude is 5 div.

Fig. 19-2

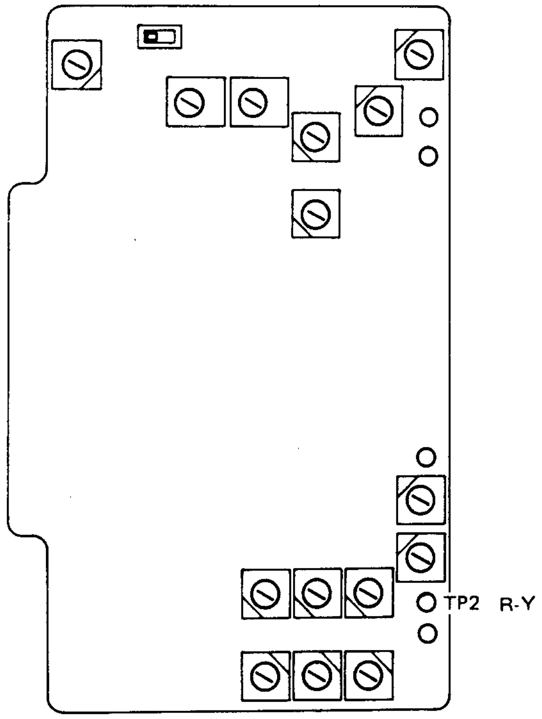
BD board or BM board



HB board


PAL
S
D
F
L
SECAM

BG board



20. BD (PAL) OR BM (PAL-M) BOARD PHASE SHIFT ADJUSTMENT **(BVM-2015P/PM ONLY)**

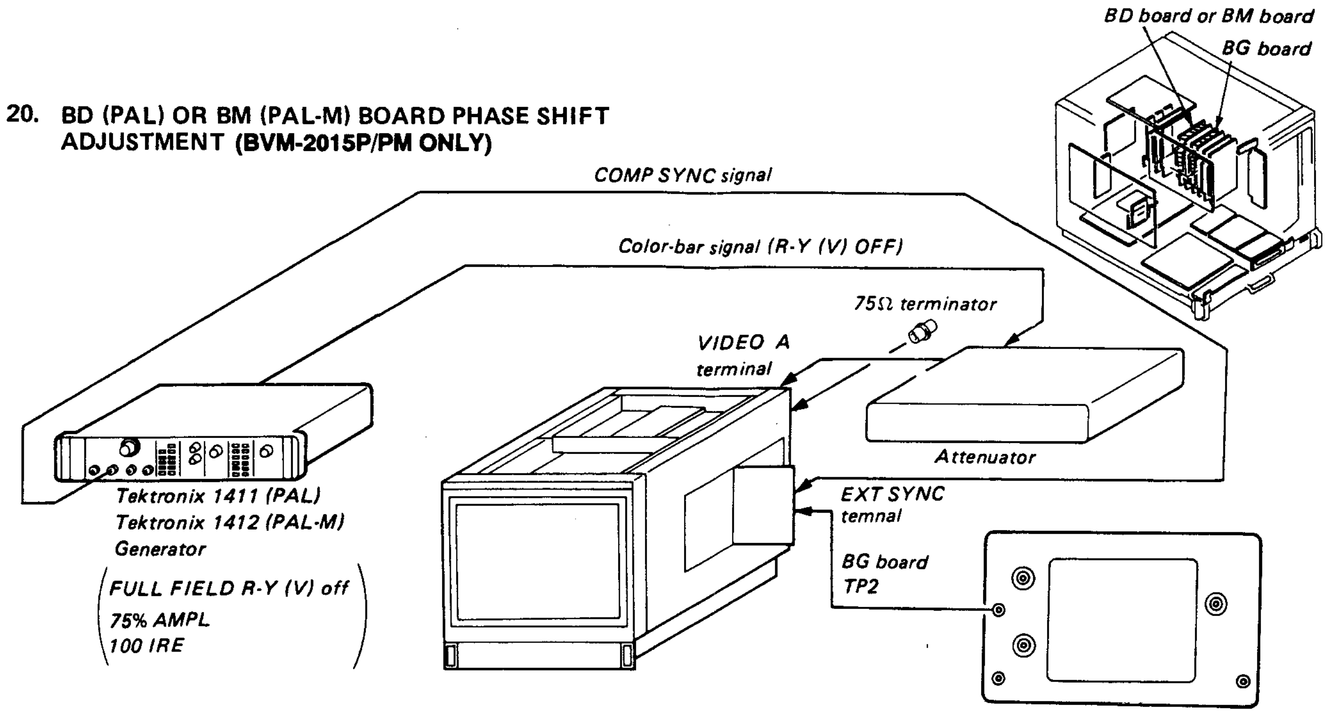

BD board or BM board
BG board
COMP SYNC signal
Color-bar signal (R-Y (V) OFF)
75Ω terminator
VIDEO A terminal
Attenuator
EXT SYNC temnal
BG board TP2
Tektronix 1411 (PAL)
Tektronix 1412 (PAL-M)
Generator
FULL FIELD R-Y (V) off
75% AMPL
100 IRE
Oscilloscope

Fig. 20-1

- * Set the PAL switch (sub control panel) of the BVM-2015P or 2015PM to the S position and RV2,CV1, CV2 on the BD or BM board to mechanical midposition.

1. Complete the connection as shown in Fig. 20-1.
   - INPUT selector (FRONT PANEL) ··················· A (▭)
   - SYNC selector (FRONT PANEL) ················ EXT (▭)
2. Connect an oscilloscope to the TP2 on the BG board.
3. Make the waveform flat with the PHASE control of front panel (R) as shown in Fig. 20-2.
4. Attenuate the signal by 10dB by using attenuator.
5. Adjust RV2 on the BD or BM board so that the output waveform becomes flat as shown in Fig. 20-2.
6. Restore the attenuator to 0dB.
7. Repeat the steps 3 to 5.

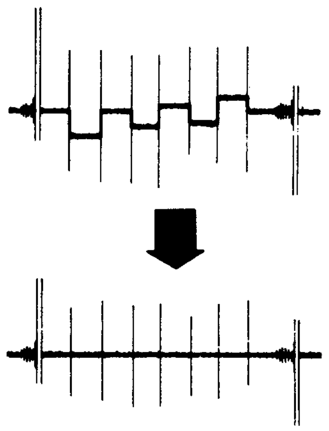
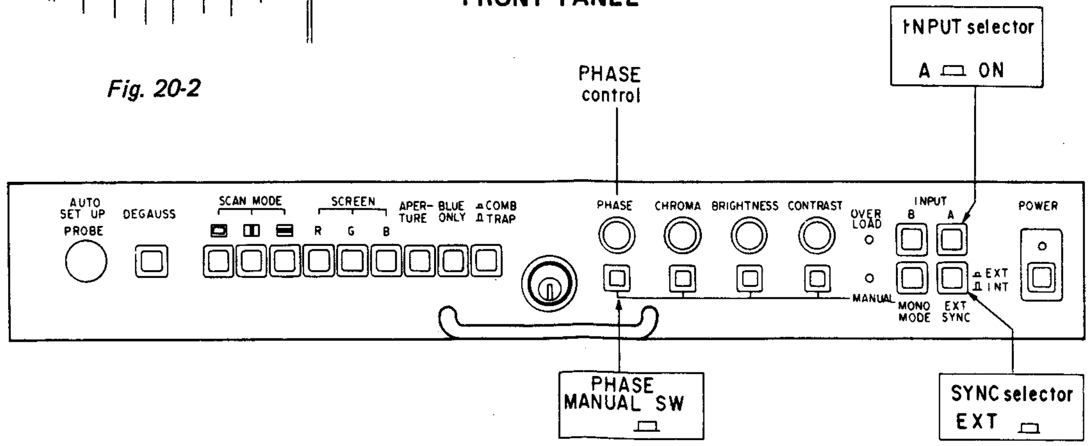
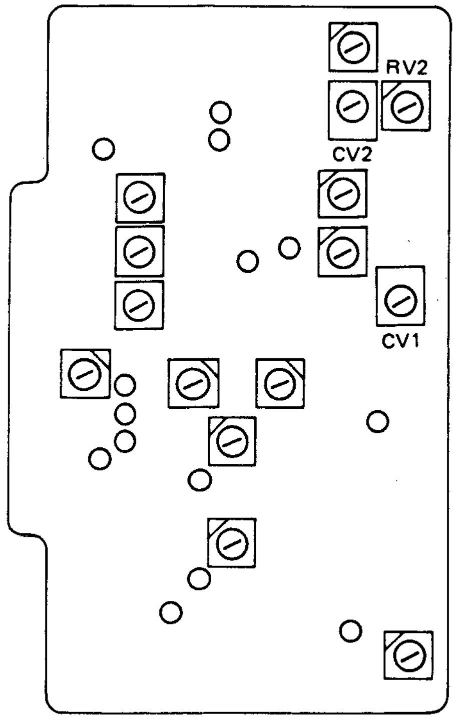


Fig. 20-2

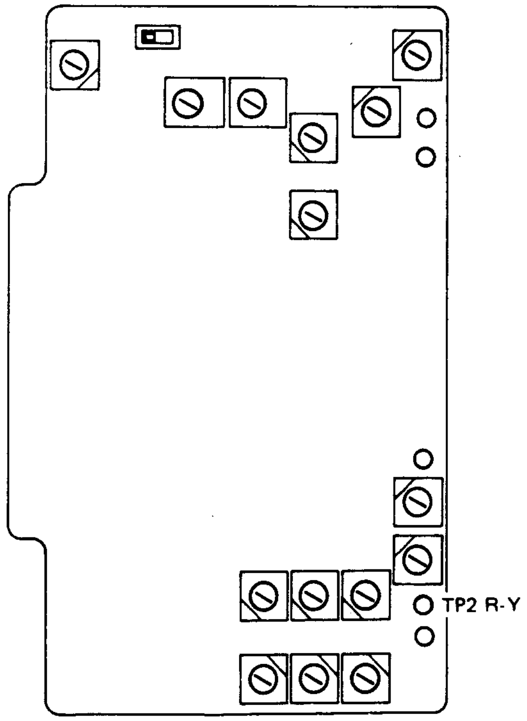
FRONT PANEL


INPUT selector
A ▭ ON
PHASE control
AUTO SET UP PROBE
DEGAUSS
SCAN MODE
SCREEN
R G B
APER-TURE
BLUE ONLY
COMB TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
INPUT
B A
POWER
MANUAL
MONO MODE
EXT SYNC
EXT
INT
PHASE MANUAL SW
SYNC selector
EXT ▭

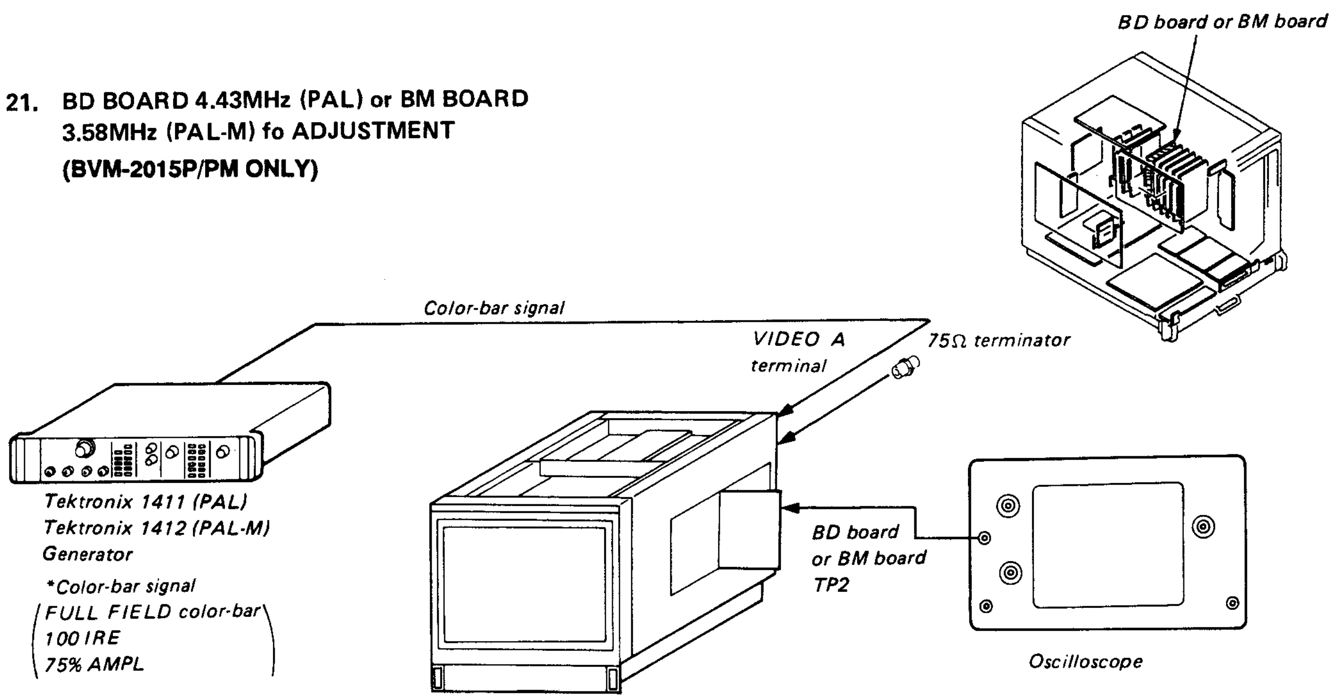
BD board or BM board



BG board



21. BD BOARD 4.43MHz (PAL) or BM BOARD 3.58MHz (PAL-M) fo ADJUSTMENT (BVM-2015P/PM ONLY)


BD board or BM board
Color-bar signal
VIDEO A
terminal
75Ω terminator
Tektronix 1411 (PAL)
Tektronix 1412 (PAL-M)
Generator
*Color-bar signal
FULL FIELD color-bar
100 IRE
75% AMPL
BD board
or BM board
TP2
Oscilloscope

1. Input color-bar signal to the VIDEO A terminal of the set.
2. Connect an oscilloscope to the TP2 of BD or BM board.
3. Short-circuit between TP11, 12 of BD or BM board with a jumper wire.
4. Adjust CV2 of BD or BM board so that the output waveform is shifted slowly as shown in Fig. 21-1.
5. Turn off the power of this monitor, and disconnect TP11, 12 of BD or BM board.

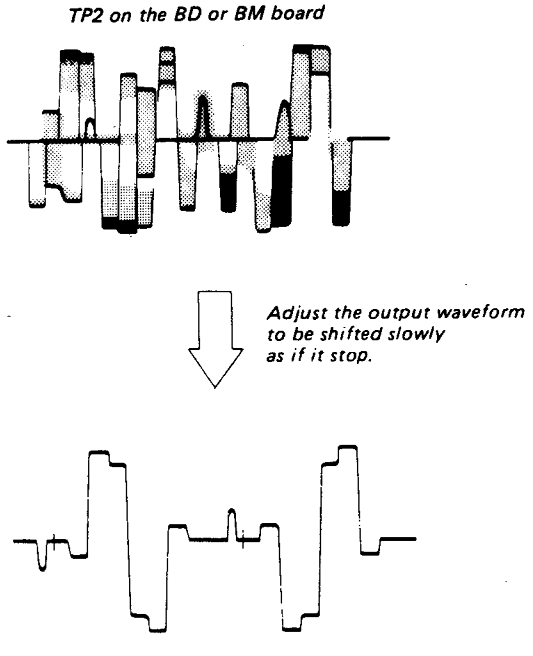
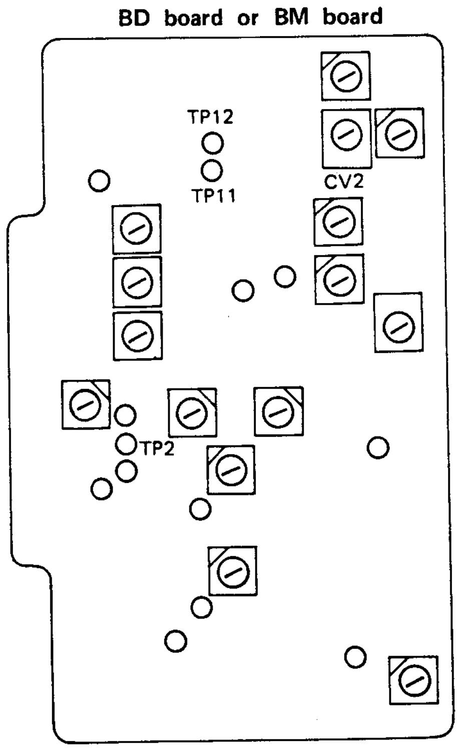

TP2 on the BD or BM board
Adjust the output waveform
to be shifted slowly
as if it stop.

Fig. 21-1


BD board or BM board
TP12
TP11
CV2
TP2

22. BD BOARD (PAL) or BM BOARD (PAL-M) COLOR DIFFERENCE PHASE ADJUSTMENT (BVM-2015P/PM ONLY)

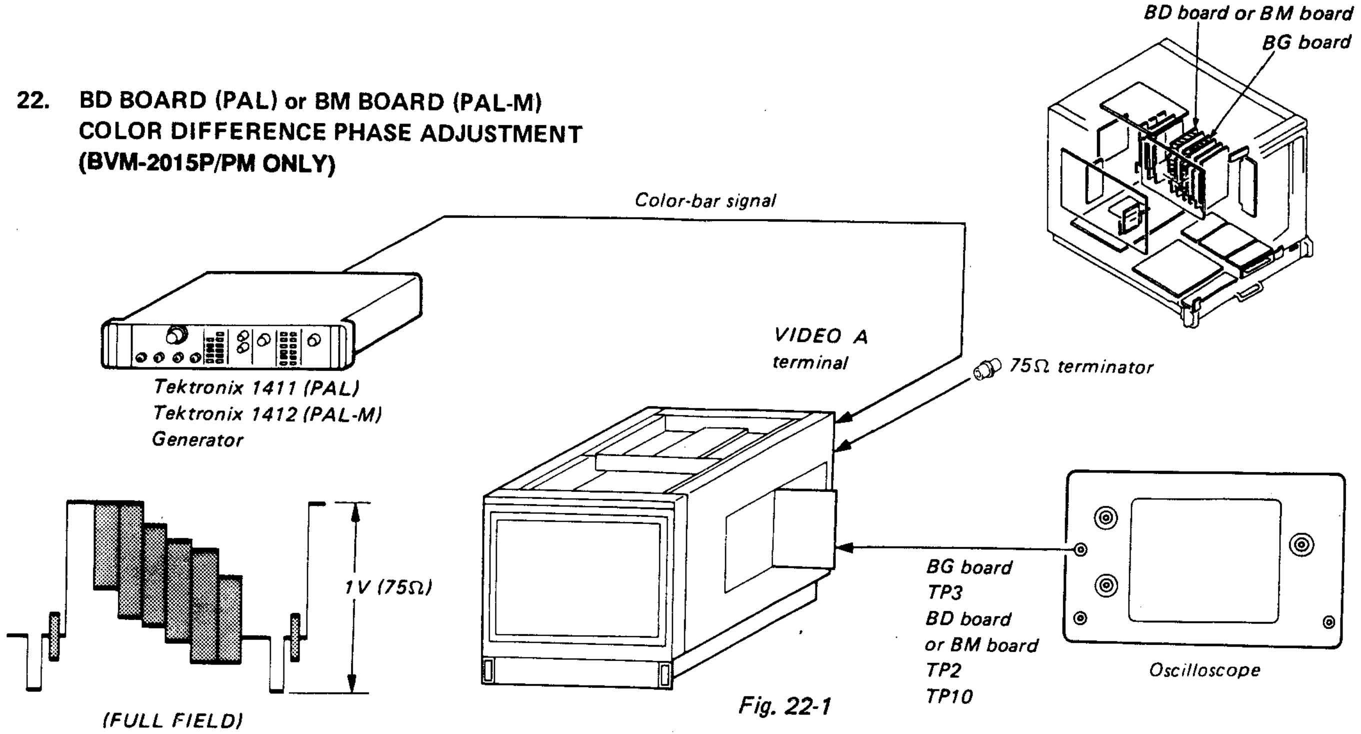

BD board or BM board
BG board
Color-bar signal
VIDEO A terminal
75Ω terminator
Tektronix 1411 (PAL)
Tektronix 1412 (PAL-M)
Generator
1 V (75Ω)
(FULL FIELD)
BG board
TP3
BD board
or BM board
TP2
TP10
Oscilloscope

Fig. 22-1

1. Complete the connections as shown in Fig. 22-1.
2. Turn on the power of this monitor. Set the INPUT switch to the A position, the SYNC switch to the INT position, and the PAL switch to the S position.

B-Y System Adjustment

3. Connect the oscilloscope probe to TP3 on the BG board, and turn off the U (B-Y) signal of the signal generator.
4. Set the oscilloscope sensitivity to 20mV/DIV, and adjust RV8 on the BD or BM board so that the output waveform is flat. (See Fig. 22-2.)

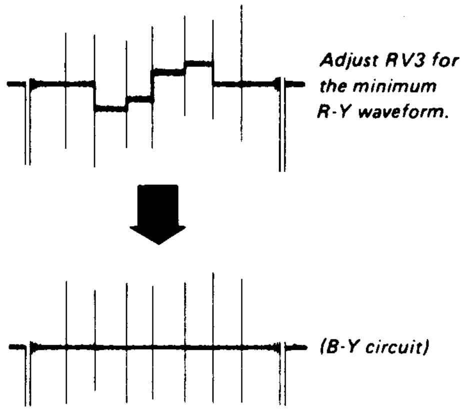

Adjust RV3 for the minimum R-Y waveform.
(B-Y circuit)

Fig. 22-2

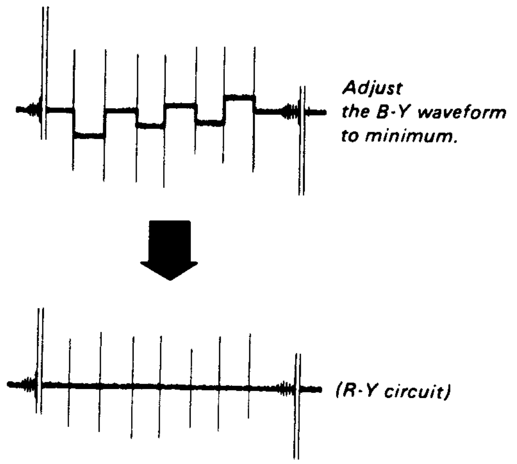

Adjust the B-Y waveform to minimum.
(R-Y circuit)

Fig. 22-3

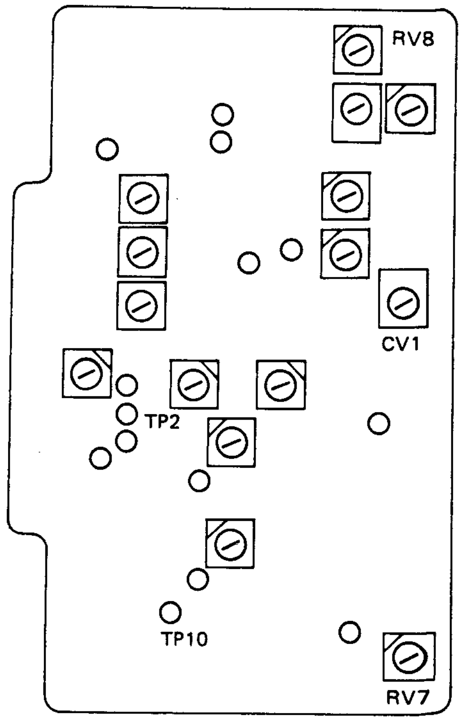
Quad Adjustment

5. Connect the oscilloscope probe to TP2 on the BD or BM board. Turn on the U signal of the signal generator, and turn off the V (R-Y) signal. Then adjust CV1 on the BD or BM board so that the output waveform is flat. (See Fig. 22-3.)
6. Repeat the steps 3 to 6.

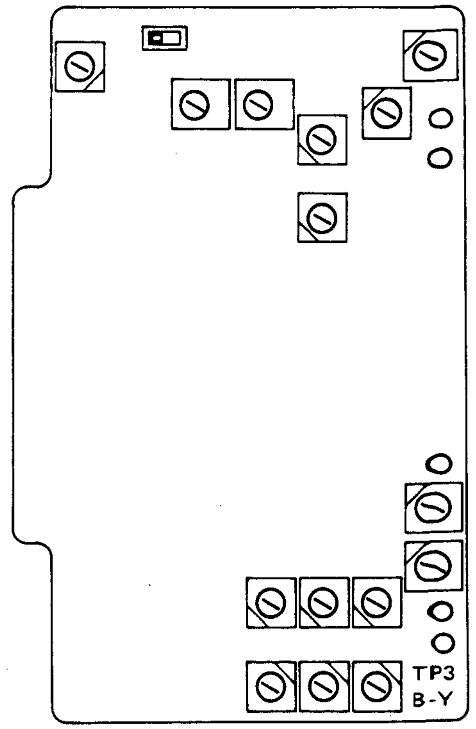
PAL-D Phase Adjustment

7. Set the PAL switch to the D position and turn on the V signal of the signal generator, and turn off U signal.
8. Connect the oscilloscope probe to TP10 on the BD or BM board.
9. Adjust RV7 on the BD board so that the output waveform is flat. (See Fig. 22-2.)
10. Finally, perform the adjustments of 3 and 4 by directly mounting the BD or BM board to the set, without using the extension board.

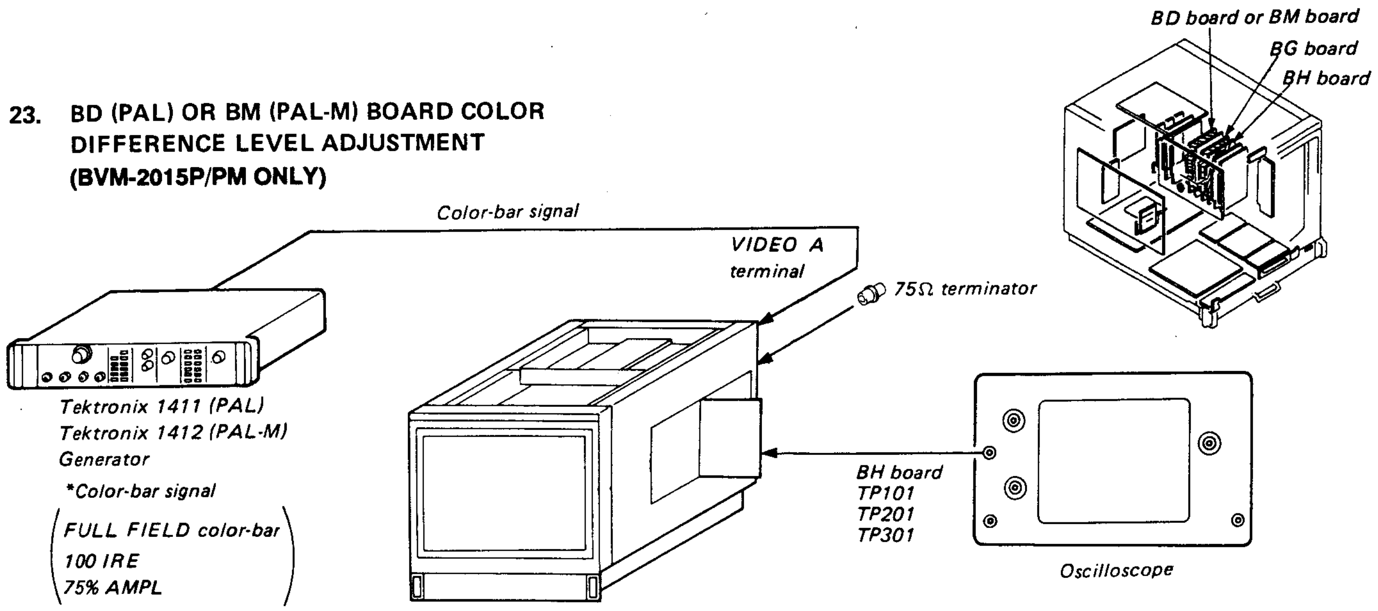
BD board or BM board


RV8
CV1
TP2
TP10
RV7

BG Board

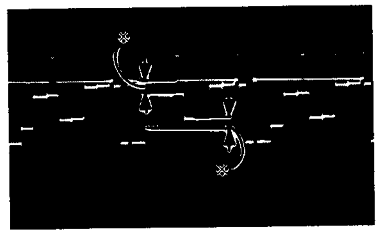


23. BD (PAL) OR BM (PAL-M) BOARD COLOR DIFFERENCE LEVEL ADJUSTMENT (BVM-2015P/PM ONLY)


BD board or BM board
BG board
BH board
Color-bar signal
VIDEO A terminal
75Ω terminator
Tektronix 1411 (PAL)
Tektronix 1412 (PAL-M)
Generator
*Color-bar signal
FULL FIELD color-bar
100 IRE
75% AMPL
BH board
TP101
TP201
TP301
Oscilloscope

- Set the PAL switch of the BVM-2015P or 2015PM to the S position.

1. Input color-bar signal to the VIDEO A terminal of the set.
2. Connect an oscilloscope to the TP101 of BH board.
3. Adjust RV3 of BD or BM board so that the level with ✱ is flat as shown in Fig. 23-1.

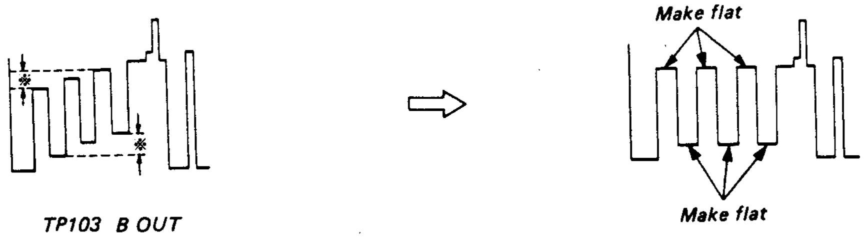


TP101 R OUT

* *Adjust the levels with ✱ to be flat respectively using RV3 of BD or BM board.*

Fig. 23-1

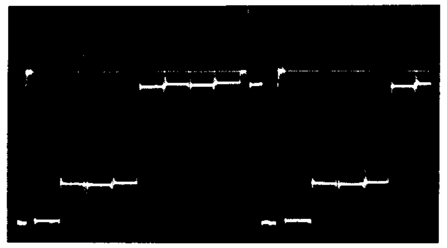
4. Connect an oscilloscope to the TP301 of BH board.
5. Adjust RV4 of BD or BM board so that the output waveform as shown in Fig. 23-2.


Make flat
Make flat

TP103 B OUT

Fig. 23-2

6. Connect an oscilloscope to the TP201 of BH board.
7. Adjust RV4 and RV5 of BG board so that the INPUT waveform becomes flat as shown in Fig. 23-3.



TP201 G OUT

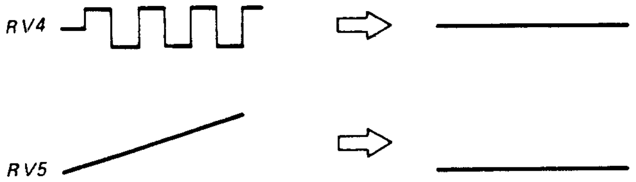
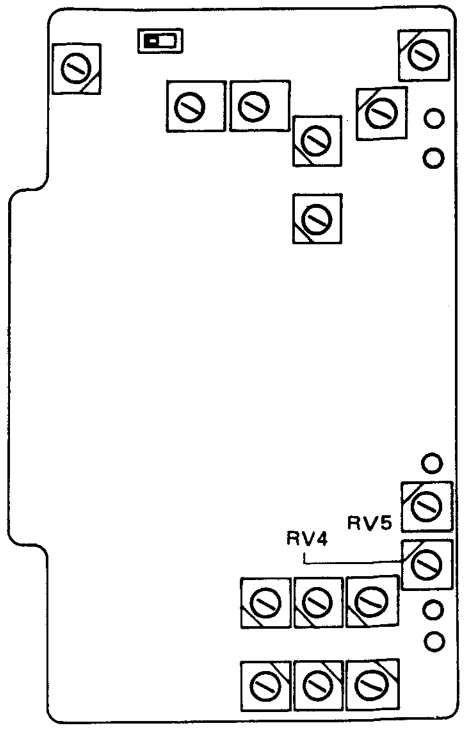
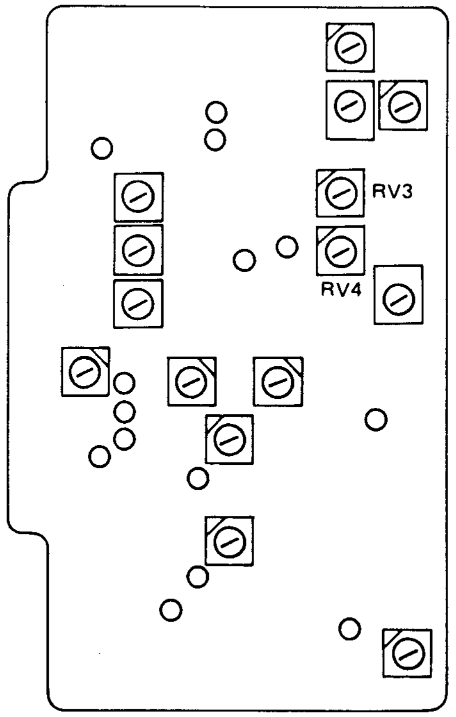


Fig. 23-3

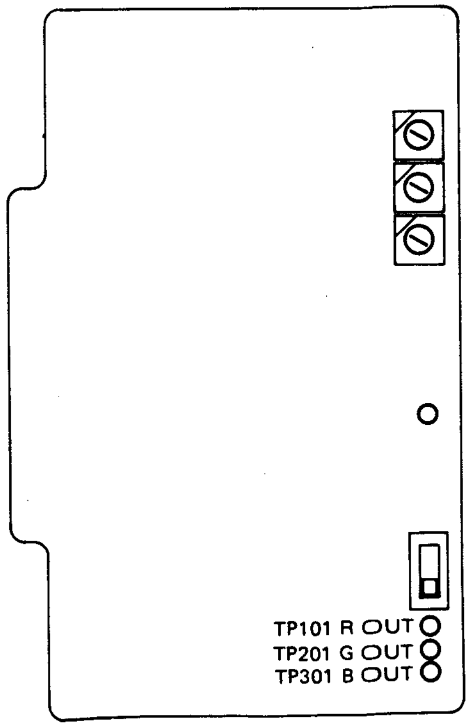
BG board



BD board or BM board



BH Board


TP101 R OUT
TP201 G OUT
TP301 B OUT

24. BD BOARD (PAL) OR BM BOARD (PAL-M) PAL-D GAIN AND CCD BIAS ADJUSTMENT (BVM-2015P/PM ONLY)

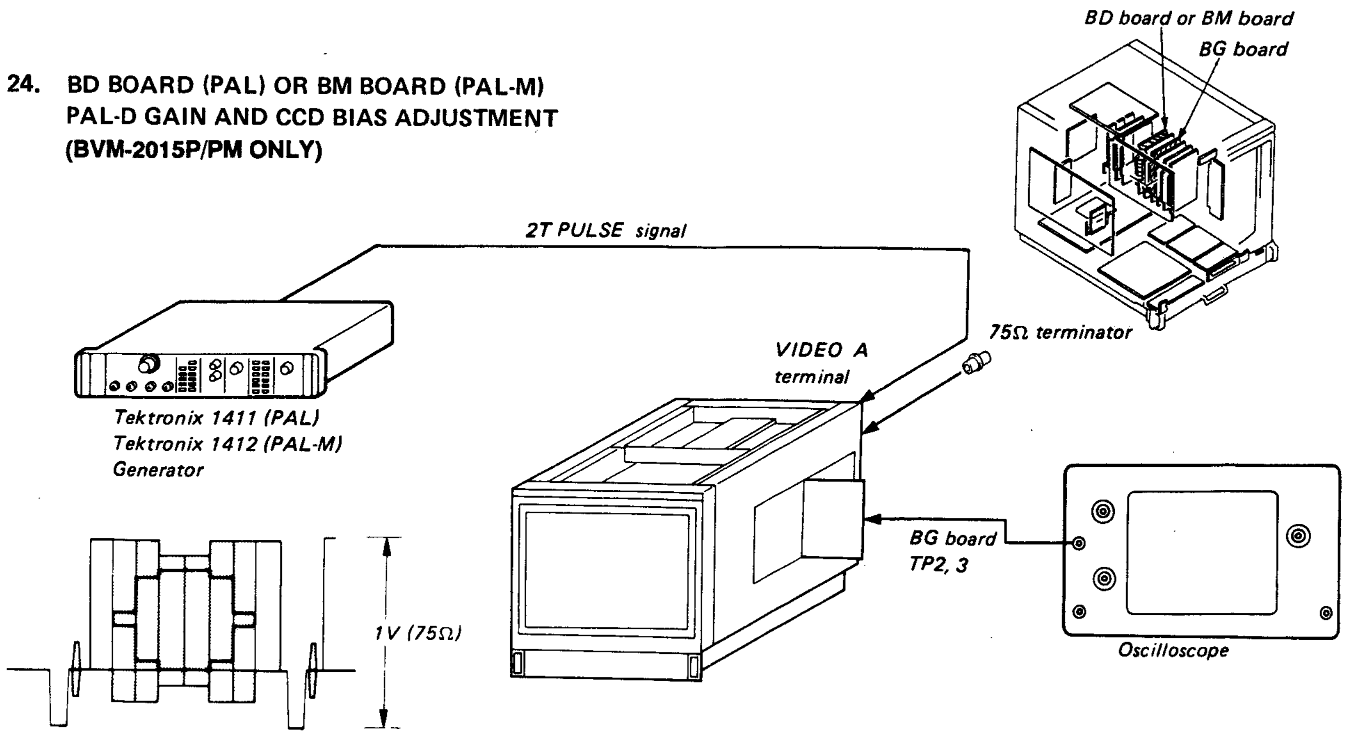

BD board or BM board
BG board
2T PULSE signal
VIDEO A terminal
75Ω terminator
Tektronix 1411 (PAL)
Tektronix 1412 (PAL-M)
Generator
1 V (75Ω)
(REVERSE MODE)
BG board TP2, 3
Oscilloscope

Fig. 24-1

- * Set the PAL switch of BVM-2015P or 2015PM to the D position.
1. Complete the connections as shown in Fig. 24-1.
   Turn on the power of this monitor. Set the INPUT switch to the A position, and the SYNC switch to the INT position.
2. Connect the oscilloscope probe to TP2 on the BG board.
3. Turn RV5 and RV6 on the BD or BM board fully clockwise.
4. By observing the waveform shown in Fig. 24-2, adjust RV9 on the BD or BM board so that it becomes A = B.
5. Adjust RV5 on the BD or BM board so that the waveform shown in Fig. 24-2 becomes flat.
6. Connect the probe of the oscilloscope to TP3 on the BG board and observe the section shown in Fig. 24-3.
7. Adjust RV10 on the BD or BM board so that the waveform of the oscilloscope becomes A = B.
8. Adjust RV6 on the BD or BM board so that the waveform shown in Fig. 24-3 becomes flat.

TP2 on the BG board

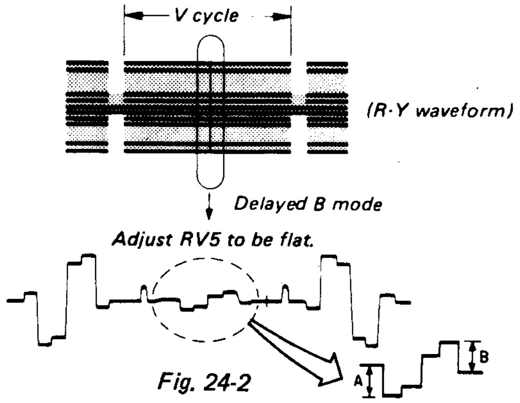

V cycle
(R-Y waveform)
Delayed B mode
Adjust RV5 to be flat.
A
B

Fig. 24-2

TP3 on the BG board

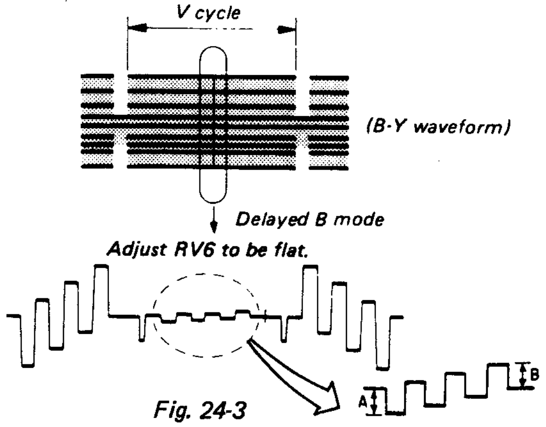
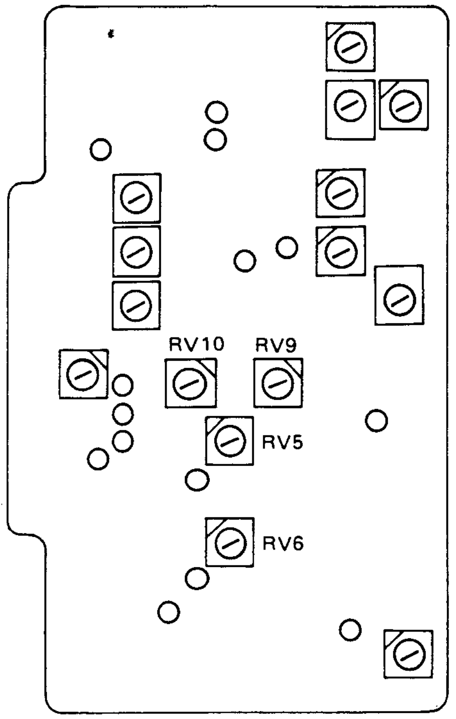
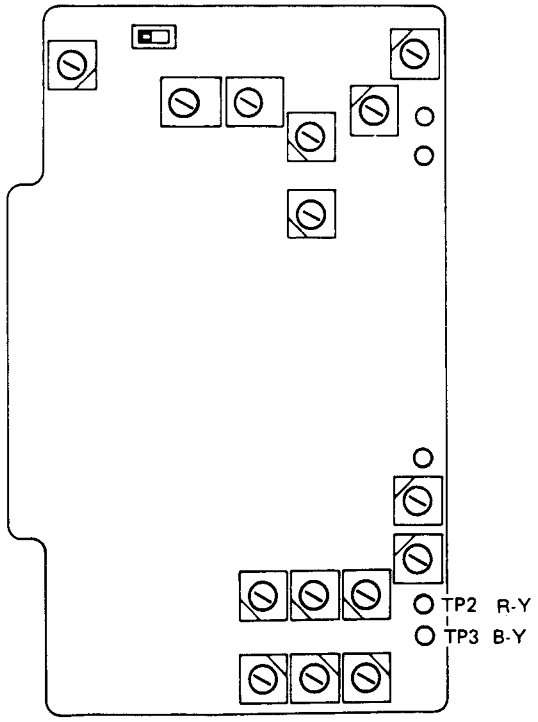

V cycle
(B-Y waveform)
Delayed B mode
Adjust RV6 to be flat.
A
B

Fig. 24-3

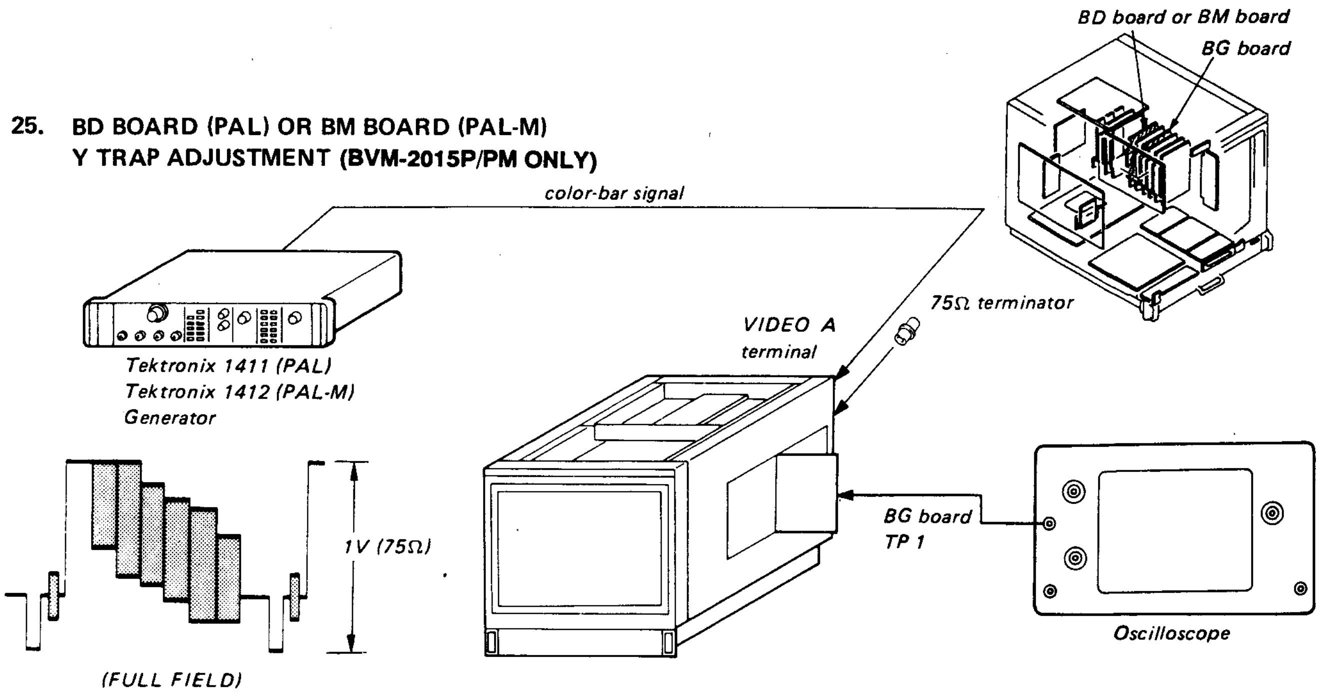
BD board or BM board


RV10
RV9
RV5
RV6

BG board


TP2 R-Y
TP3 B-Y

25. BD BOARD (PAL) OR BM BOARD (PAL-M) Y TRAP ADJUSTMENT (BVM-2015P/PM ONLY)


BD board or BM board
BG board
color-bar signal
75Ω terminator
VIDEO A terminal
Tektronix 1411 (PAL)
Tektronix 1412 (PAL-M)
Generator
1V (75Ω)
(FULL FIELD)
BG board TP 1
Oscilloscope

1. Input color-bar signal to VIDEO A terminal of the set.
2. Connect an oscilloscope to the TP1 of BG board.
3. Adjust L1 of BD or BM board so that 4.43 MHz (PAL) or 3.58 MHz (PAL-M) subcarrier is minimum as shown in Fig. 25-1.

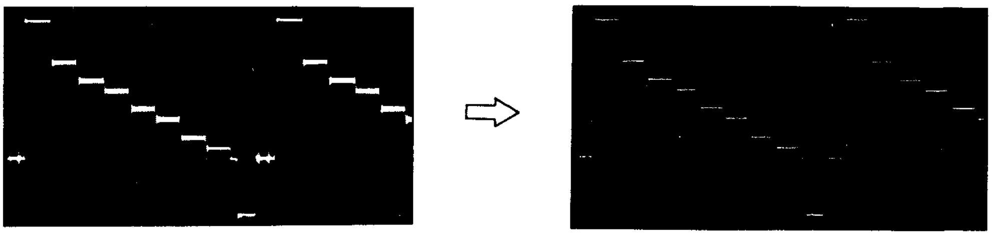
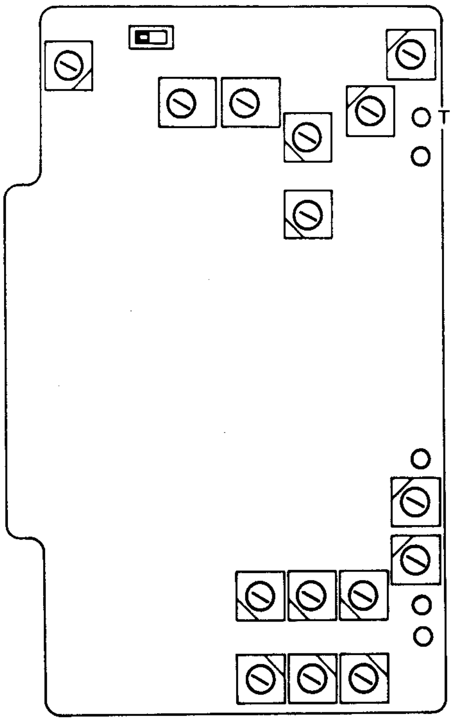
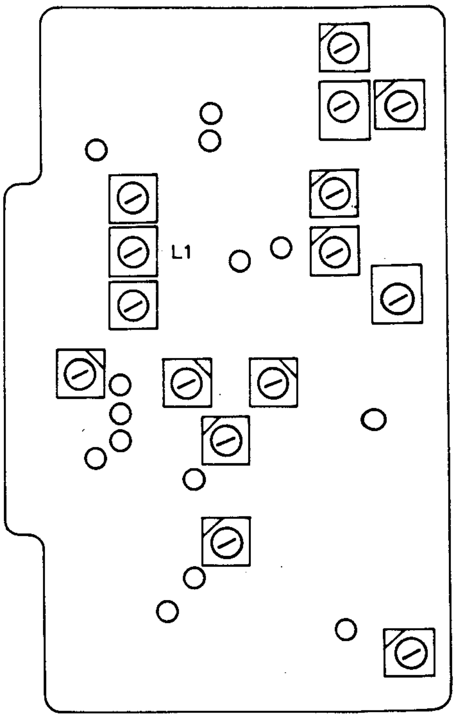


Fig. 25-1

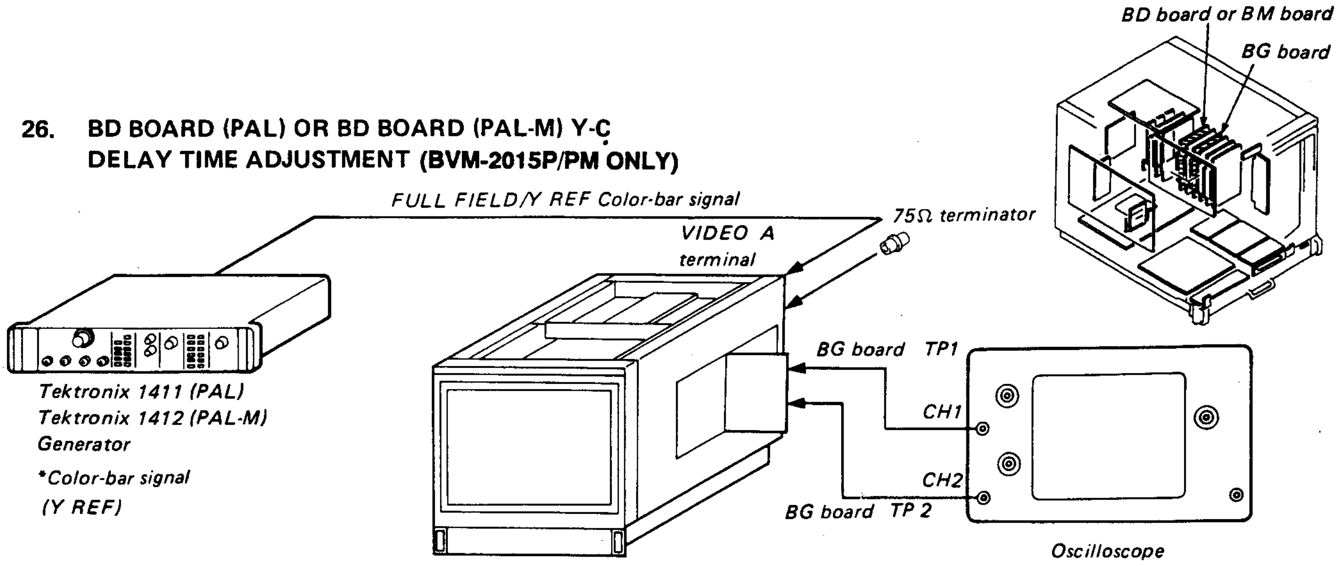
BG board



BD board or BM board



26. BD BOARD (PAL) OR BD BOARD (PAL-M) Y-C DELAY TIME ADJUSTMENT (BVM-2015P/PM ONLY)


BD board or BM board
BG board
FULL FIELD/Y REF Color-bar signal
VIDEO A terminal
75Ω terminator
BG board TP1
CH1
CH2
BG board TP 2
Oscilloscope
Tektronix 1411 (PAL)
Tektronix 1412 (PAL-M)
Generator
*Color-bar signal
(Y REF)

* Set the PAL switch of BVM-2015P or 2015PM to the S position.

1. Input color-bar signal (FULL FIELD/Y REF) to the VIDEO A terminal of the set.
2. Connect an oscilloscope (CH-1 probe) to the TP1 of BG board and connect an oscilloscope (CH-2 probe) to the TP2 of BG board (VERT mode of the oscilloscope is CHOP).
3. Adjust RV1 of BD or BM board so that the output waveform as shown in Fig. 26-1.

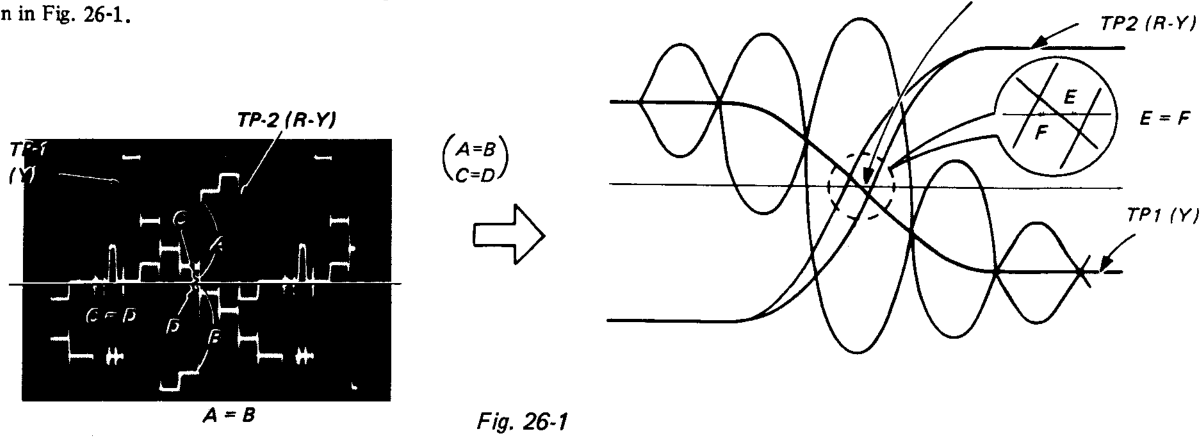
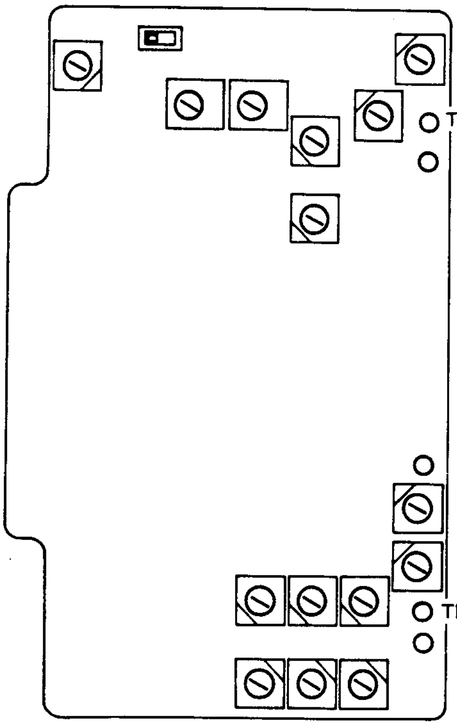
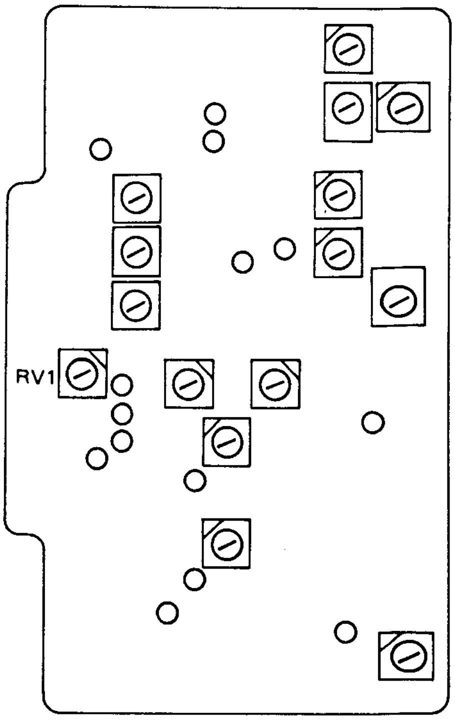

Adjust RV1 so that E is equal to F.
TP-1 (Y)
TP-2 (R-Y)
C
A
C = D
D
B
A = B
(A=B C=D)
TP2 (R-Y)
E
F
E = F
TP1 (Y)

Fig. 26-1

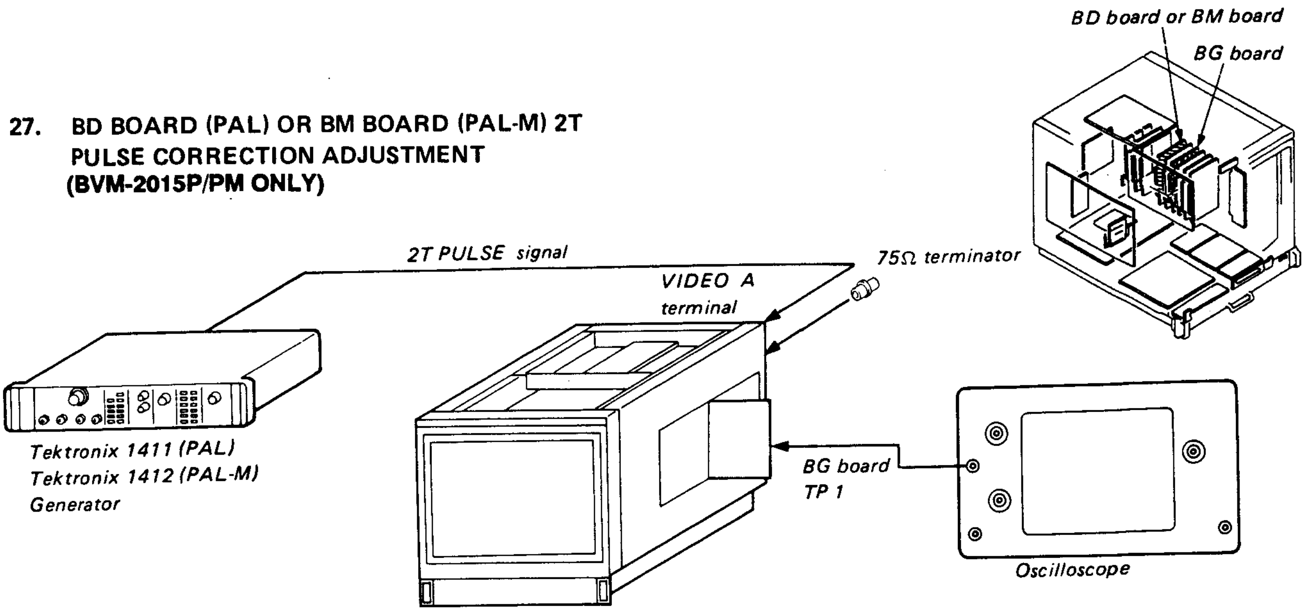
BG Board



BD board or BM board



27. BD BOARD (PAL) OR BM BOARD (PAL-M) 2T PULSE CORRECTION ADJUSTMENT (BVM-2015P/PM ONLY)


BD board or BM board
BG board
2T PULSE signal
VIDEO A terminal
75Ω terminator
Tektronix 1411 (PAL)
Tektronix 1412 (PAL-M)
Generator
BG board TP 1
Oscilloscope

1. Input 2T pulse signal to VIDEO A terminal of the set.
2. Connect an oscilloscope to the TP1 of BG board.
3. Adjust L2 of BD or BM board so that A is equal to B as shown in Fig. 27-1.
4. Change the input signal from 2T pulse to T pulse, and make sure the waveform balance is not lost extremely as shown in Fig. 27-1.

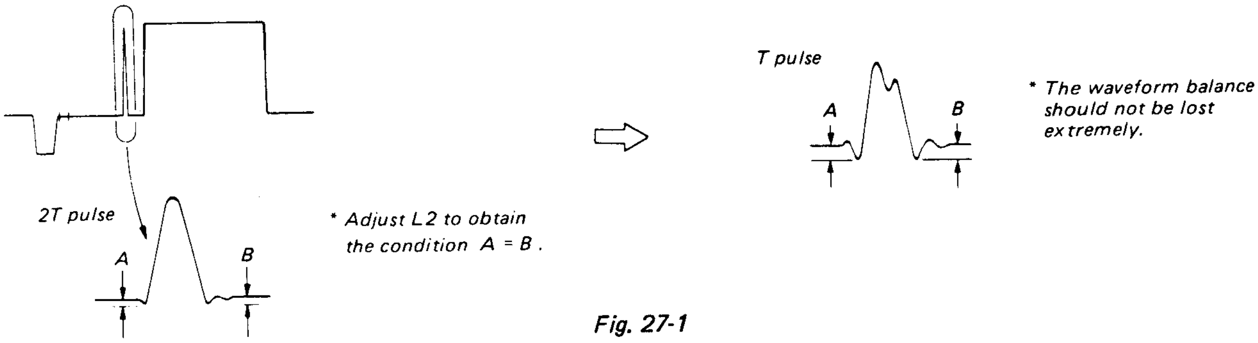
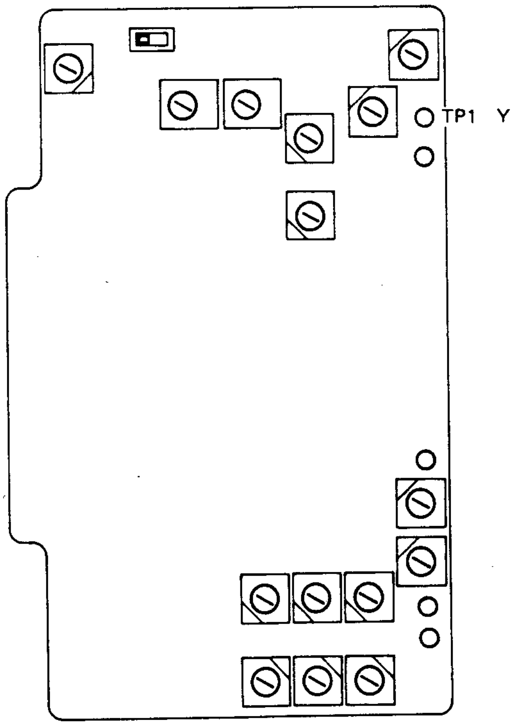
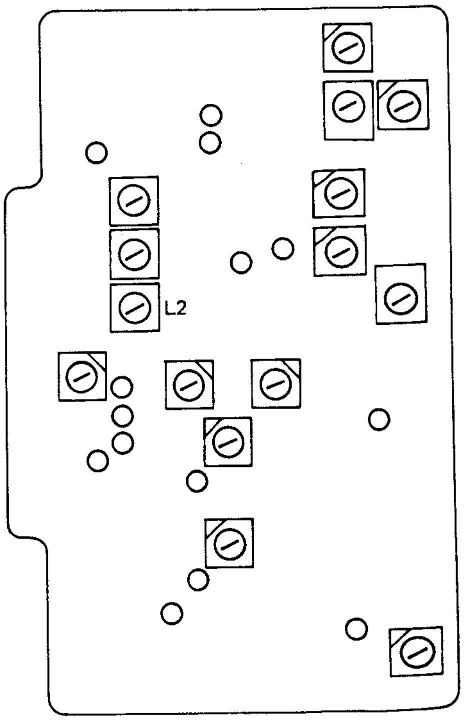

2T pulse
A
B
* Adjust L2 to obtain the condition A = B .
T pulse
A
B
* The waveform balance should not be lost extremely.

Fig. 27-1

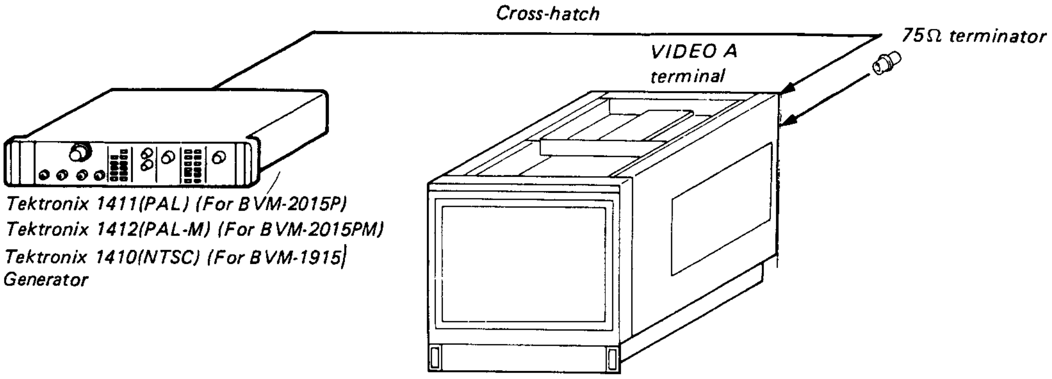
BG board

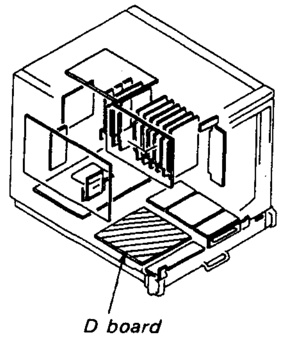


BD board or BM board



28. DA Board LINEARITY ADJUSTMENT


Cross-hatch
VIDEO A terminal
75Ω terminator
Tektronix 1411(PAL) (For BVM-2015P)
Tektronix 1412(PAL-M) (For BVM-2015PM)
Tektronix 1410(NTSC) (For BVM-1915)
Generator



• Vertical Pincushion Adjustment

1. Input only the H line of cross-hatch signal.
2. Minimize the X.BOW distortion with X.BOW (RV11) on the DA board as shown in third from the top of Fig. 28-1.
3. Minimize the T and B pincushion distorion gain with T.B.P (RV12) on the DA board as shown in second from the top of Fig. 28-1.

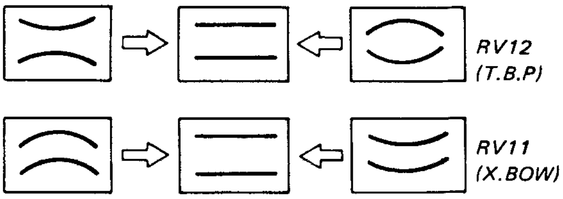
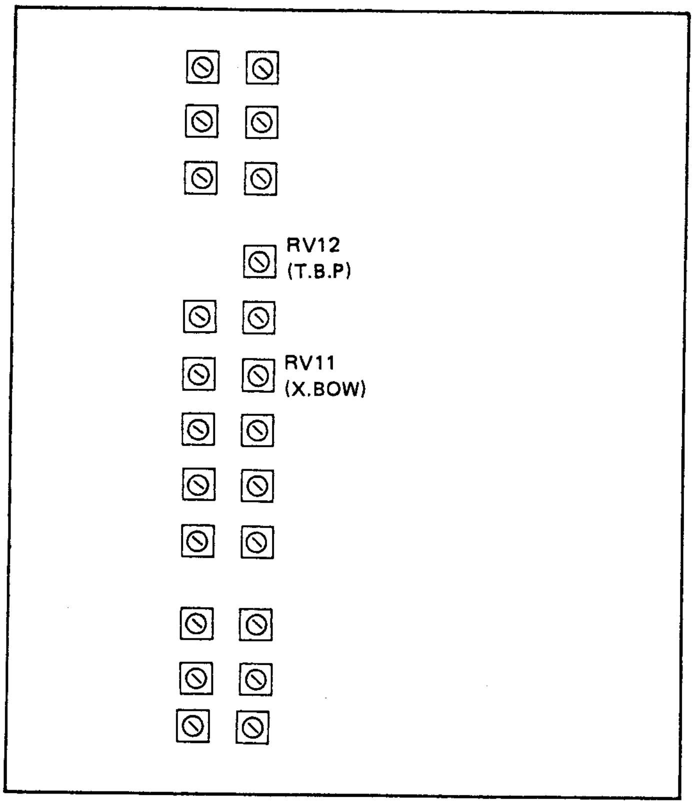
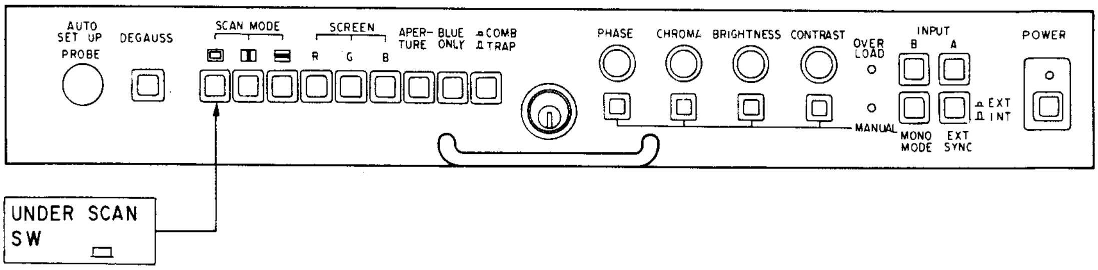

RV12
(T.B.P)
RV11
(X.BOW)

Fig. 28-1

DA board


RV12
(T.B.P)
RV11
(X.BOW)

FRONT PANEL


AUTO SET UP PROBE
DEGAUSS
SCAN MODE
SCREEN
R G B
APER-TURE
BLUE ONLY
COMB TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
MANUAL
INPUT
B A
EXT INT
MONO MODE
EXT SYNC
POWER
UNDER SCAN SW

- **Vertical Lineality Adjustment**

1. Input only the H line of cross-hatch signal.
2. Adjust V center with V.CENTER (RV10) on the DA board.
3. Adjust the balance of V lineality with V.LB (RV9) on the DA board as shown in Fig. 28-2.
4. Adjust the gain of V lineality with V.LG (RV8) on the DA board as shown in Fig. 28-3.
5. Adjust the V.HEIGHT with V.H.N (RV3) on the DA board.
6. Mark tracking by repeating step 3. through 5.

RV9 ..... V LIN BALANCE

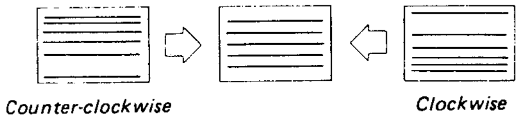

Counter-clockwise
Clockwise

Fig. 28-2

RV8 ..... V LIN GAIN

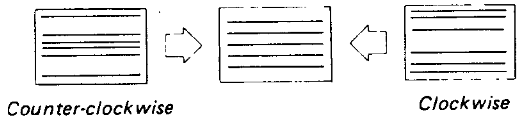

Counter-clockwise
Clockwise

Fig. 28-3

Side Pincushion Adjustment

1. Input only the V line of cross-hatch signal.
2. Minimize the Y.BOW distortion with Y.BOW (RV13) on the DA board as shown in Fig. 28-7.
3. Minimize the Y.TILT distortion with Y.TILT (RV25) on the DA board is shown in Fig. 28-7.
4. Minimize the side pincushion distortion with S.P.N (RV5) on the DA board as shwon in Fig. 28-4.
5. Minimize the side pincushion tilt distortion with S.P.T (RV7) on the DA board as shown in Fig. 28-5.
6. Set the SCAN selector to UNDER position.
7. Minimize the side pincushion distortion with S.P.U (RV6) on the DA board as shown in Fig. 28-4.

RV5 (S.P.N)
RV6 (S.P.U)

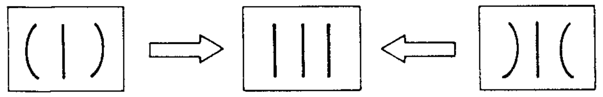


Fig. 28-4

RV7 (S.P.T)

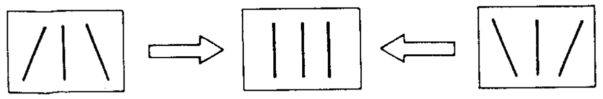


Fig. 28-5

RV25 (Y.TILT)

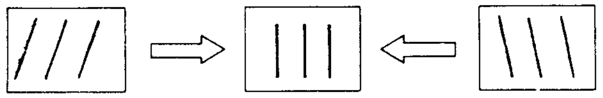


Fig. 28-6

RV13 (Y.BOW)

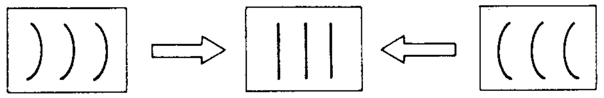


Fig. 28-7

- **Horizontal Lineality Adjustment**

1. Input only the V line of cross-hatch signal.
2. Adjust the horizontal centering with H CENTER (RV14) on the DA board.
3. Adjust the balance of H.lineality with H.L.B (RV28) on the DA board as shown in Fig. 28-8.
4. Adjust the gain of H.lineality with H.L.G (RV27) on the DA board as shown in Fig. 28-9.
5. Adjust the H.WIDTH with H.W.N (RV1) on the DA board.
6. Mark tracking by repeating step 3. through 5.
7. Set the SCAN selector to UNDER position.
8. Adjust the H.WIDTH with H.W.U (RV2) on the DA board.

RV28 (H.L.B)

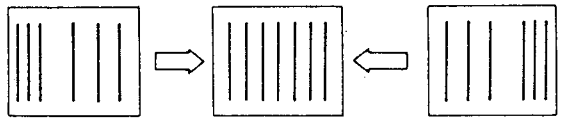


Fig. 28-8

RV27 (H.L.G)

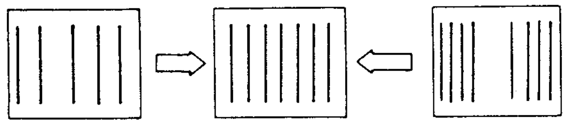
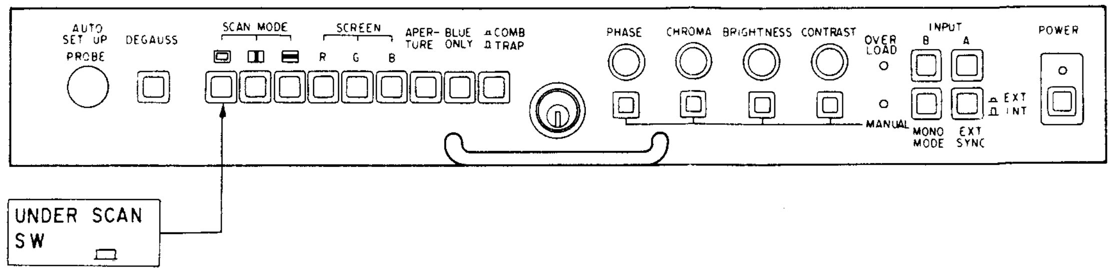
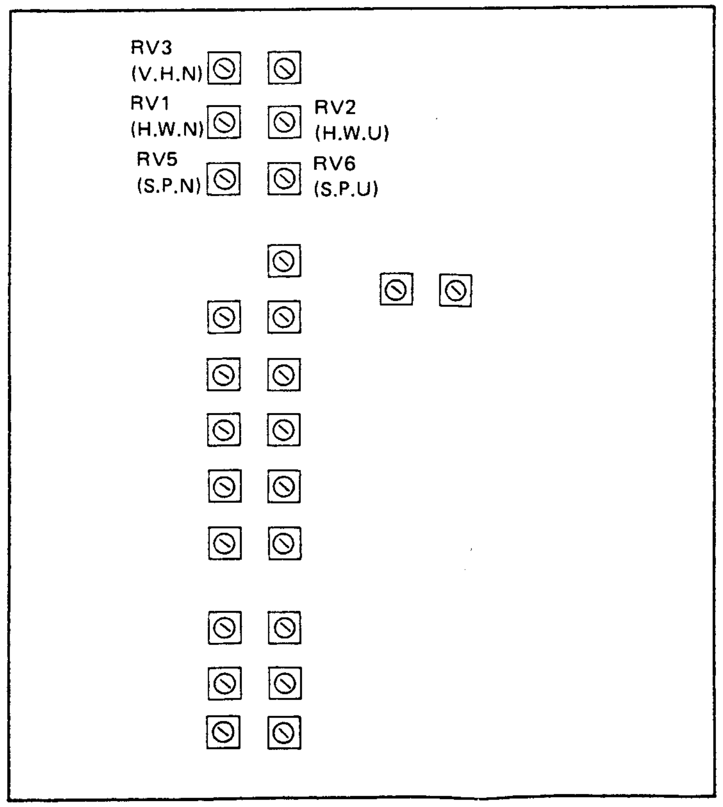


Fig. 28-9

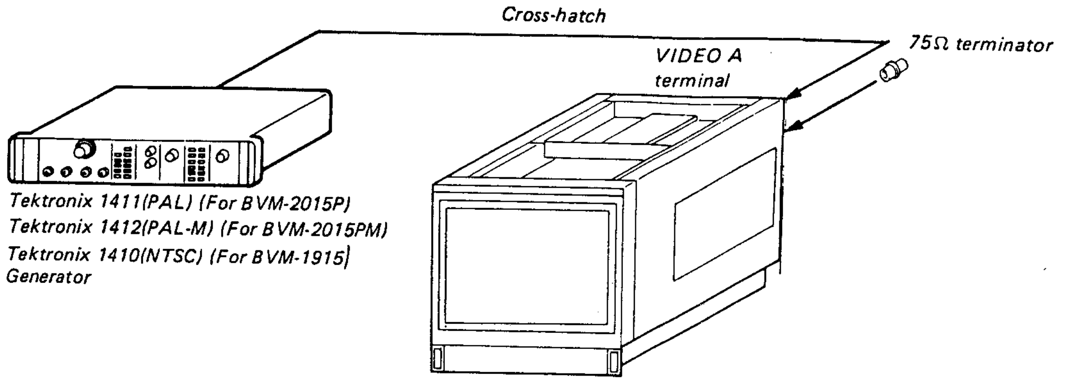
FRONT PANEL

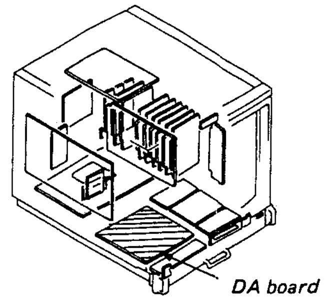

AUTO SET UP
PROBE
DEGAUSS
SCAN MODE
SCREEN
R
G
B
APER-TURE
BLUE ONLY
COMB
TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
INPUT
B
A
EXT
INT
MANUAL
MONO MODE
EXT SYNC
POWER
UNDER SCAN SW

DA board


RV3 (V.H.N)
RV1 (H.W.N)
RV2 (H.W.U)
RV5 (S.P.N)
RV6 (S.P.U)

29. DA, DB Board LINEARITY ADJUSTMENT


Cross-hatch
VIDEO A terminal
75Ω terminator
Tektronix 1411(PAL) (For BVM-2015P)
Tektronix 1412(PAL-M) (For BVM-2015PM)
Tektronix 1410(NTSC) (For BVM-1915)
Generator



• H.OSC Free-run Adjustment

1. Set the SYNC selector to EXT.
2. Adjust H.FREQ. (RV202) on the DB board until the picture movement is still or slow.

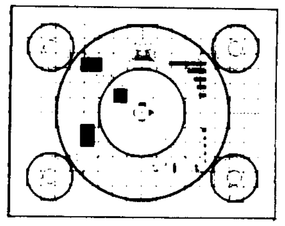


Fig. 29-1

• Horizontal Phase and Horizontal Blanking Adjustments

1. Set the SCAN selector to UNDER position.
2. Turn the horizontal blanking controls H.BLK.R fully clockwise and H.BLK.L fully counterclockwise. (When the raster at both sides of screen are not appear completely, turn H.W.U (RV2) until obtaining the raster.)

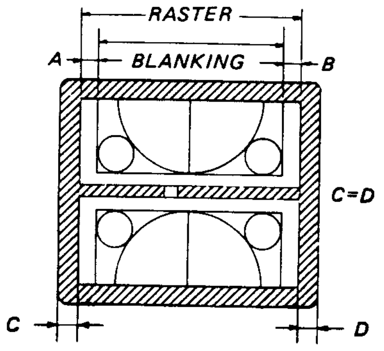

RASTER
BLANKING
A
B
C=D
C
D

Fig. 29-2

3. Adjust H.PHASE (RV201) on the DB board for both sides of raster width without signal component coincidence.

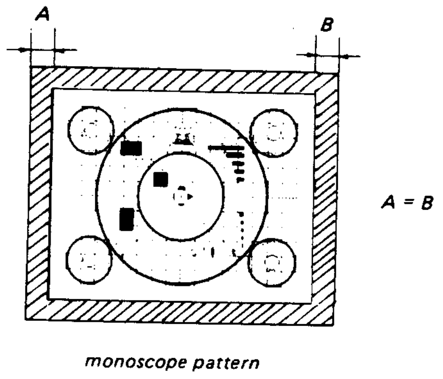

A
B
A = B
monoscope pattern

Fig. 29-3

4. Adjust H.BLK.R/H.BLK.L (RV24 and RV23) on the DA board so that the raster width without signal component become half.

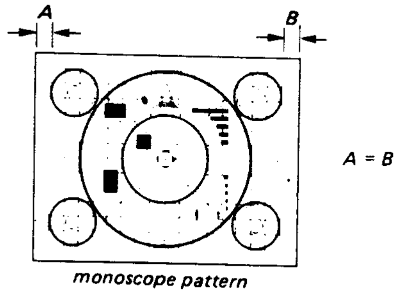
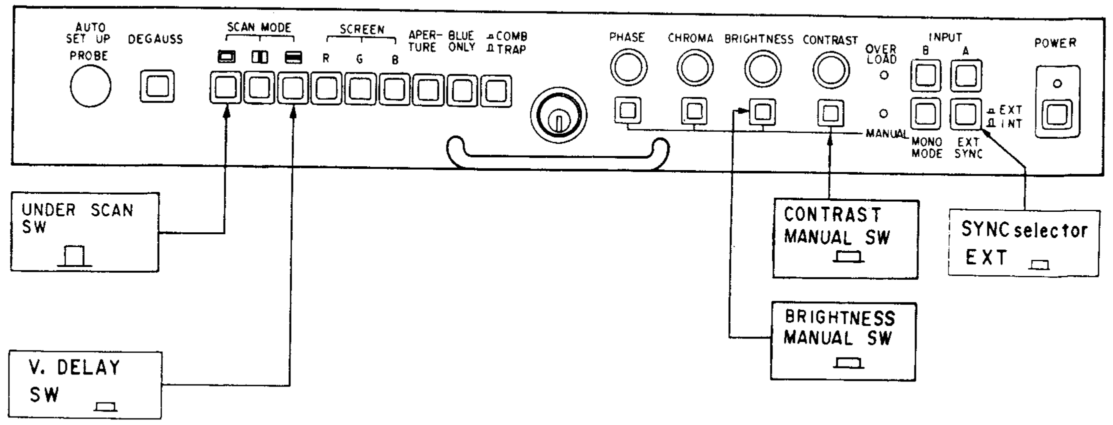
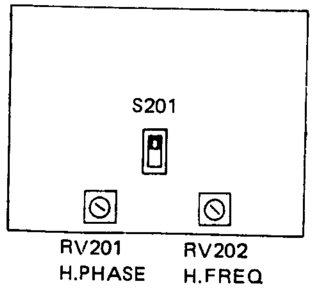

A
B
A = B
monoscope pattern

Fig. 29-4

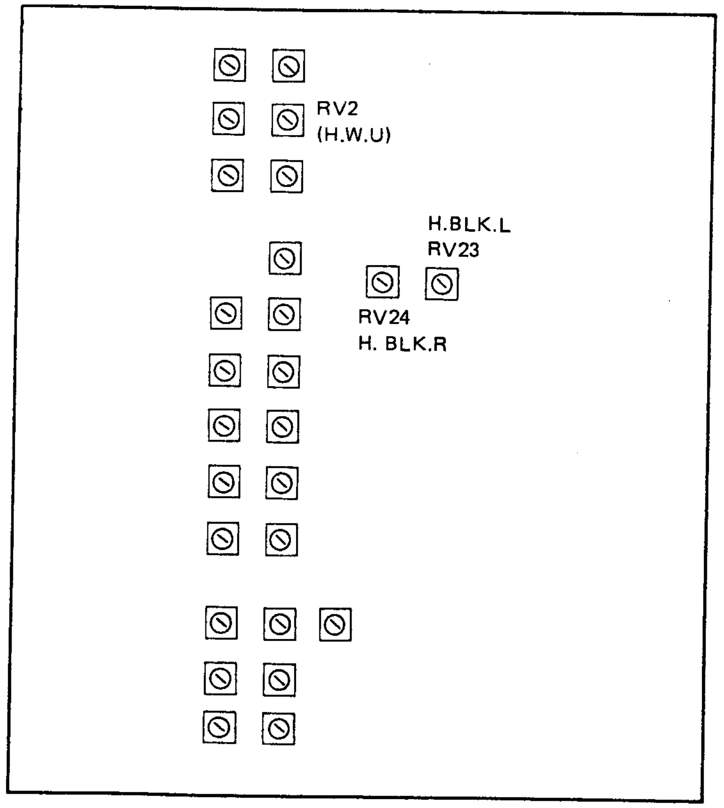
FRONT PANEL


AUTO SET UP PROBE
DEGAUSS
SCAN MODE
SCREEN
R
G
B
APER-TURE
BLUE ONLY
⊿COMB ⊓TRAP
PHASE
CHROMA
BRIGHTNESS
CONTRAST
OVER LOAD
INPUT
B
A
POWER
MANUAL
MONO MODE
EXT SYNC
⊿EXT ⊓INT
UNDER SCAN SW
V. DELAY SW
CONTRAST MANUAL SW
BRIGHTNESS MANUAL SW
SYNC selector EXT

DB board

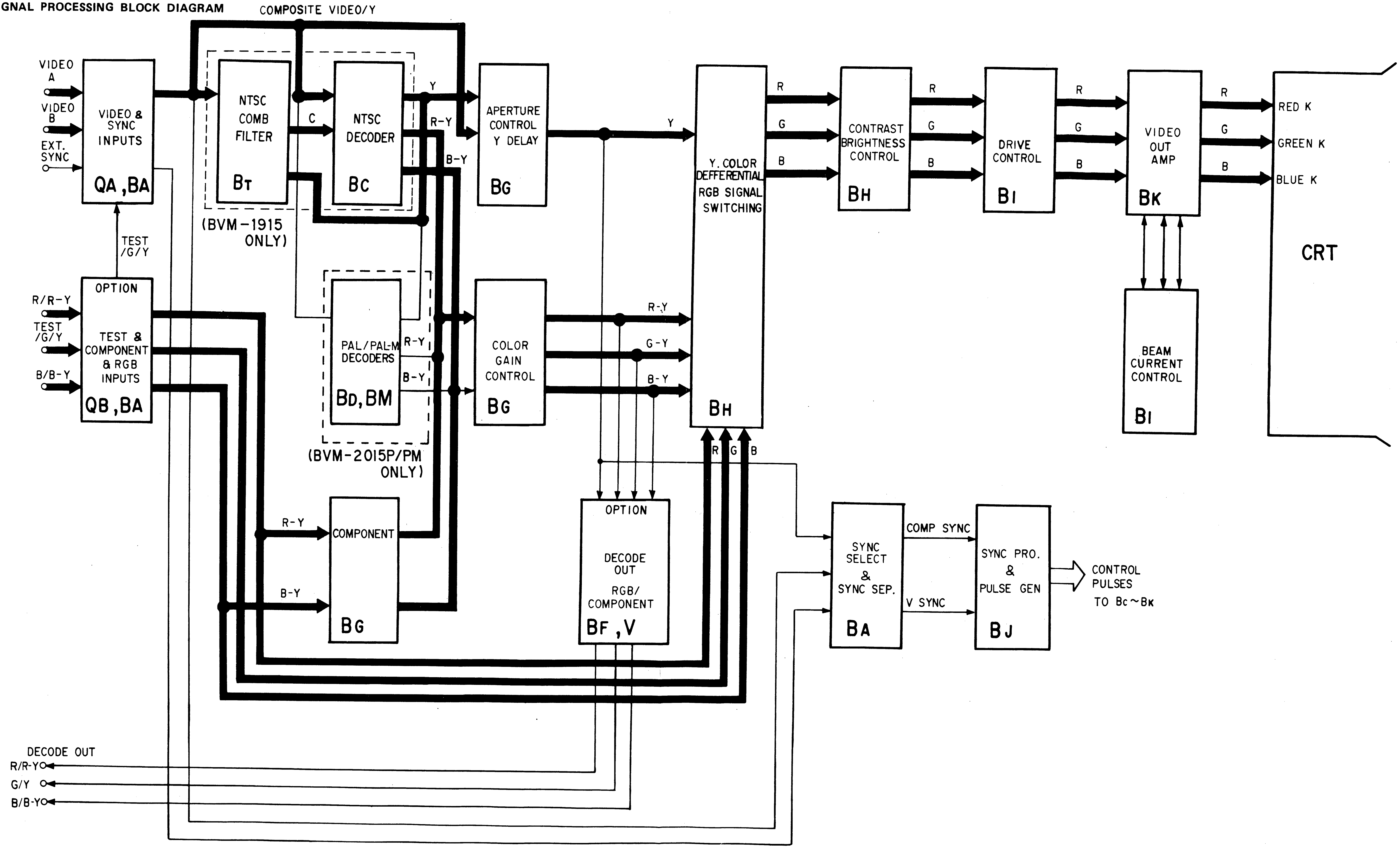

S201
RV201
H.PHASE
RV202
H.FREQ

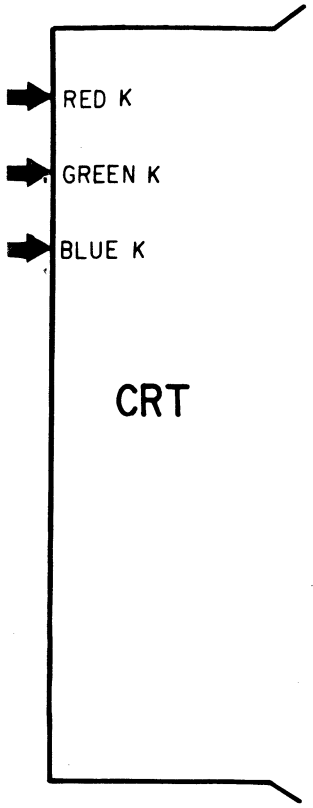
DA board


RV2
(H.W.U)
H.BLK.L
RV23
RV24
H. BLK.R

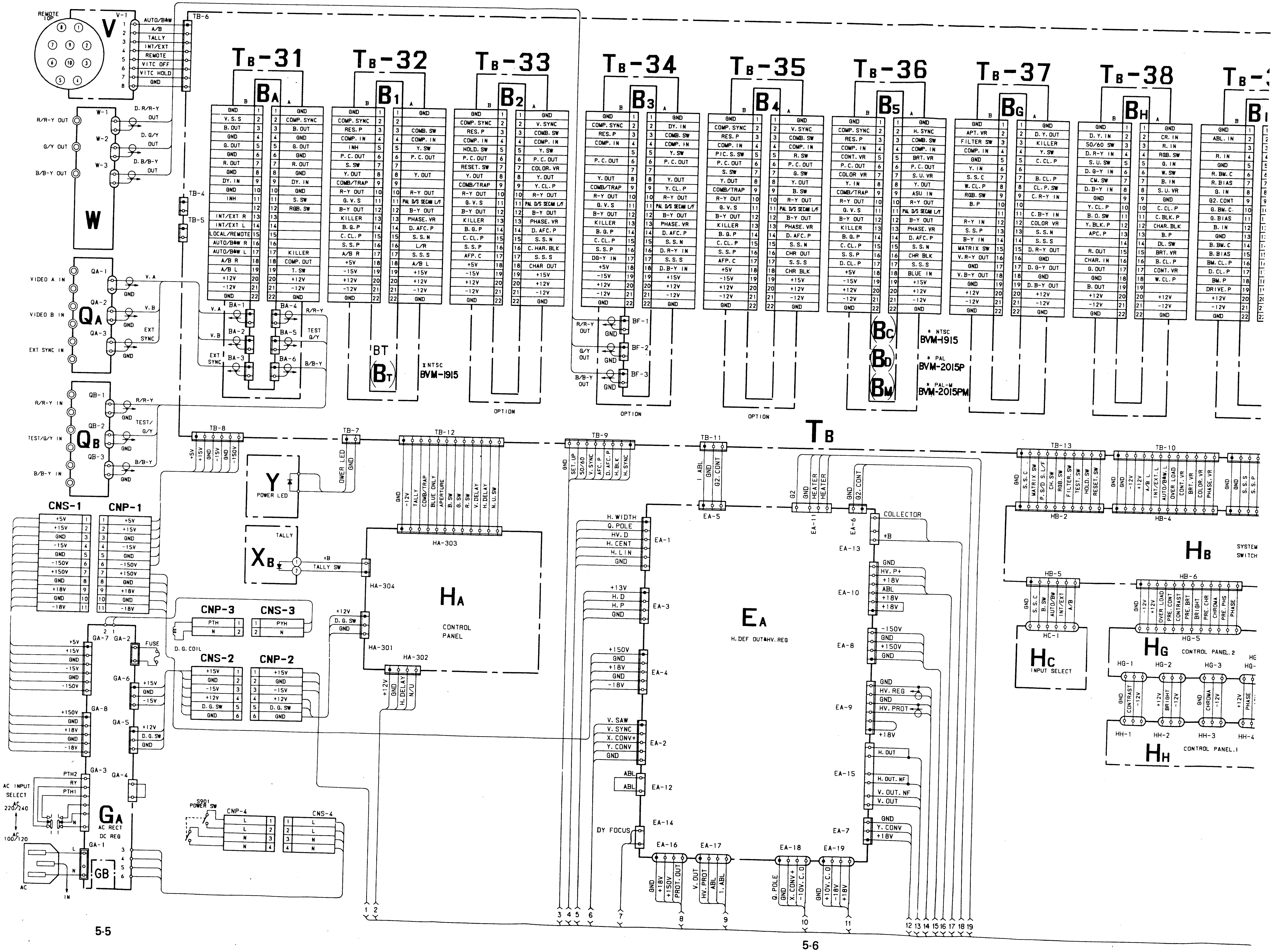
SECTION 5
DIAGRAMS

5-1. BLOCK DIAGRAM
SIGNAL PROCESSING BLOCK DIAGRAM

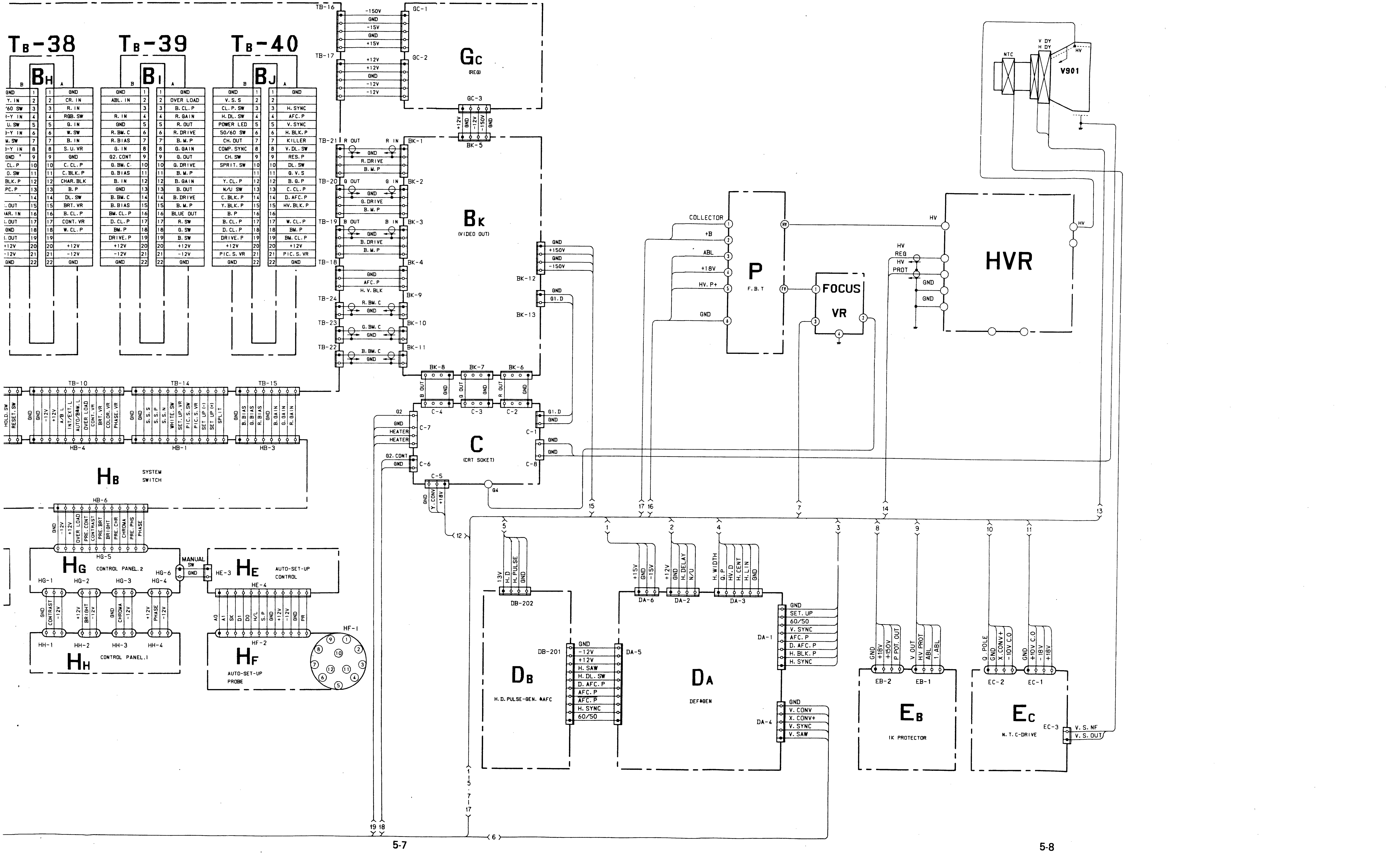

COMPOSITE VIDEO/Y
VIDEO A
VIDEO B
EXT. SYNC
VIDEO & SYNC INPUTS
QA ,BA
TEST /G/Y
NTSC COMB FILTER
BT
C
NTSC DECODER
BC
(BVM-1915 ONLY)
Y
R-Y
B-Y
APERTURE CONTROL Y DELAY
BG
Y
Y. COLOR DEFFERENTIAL RGB SIGNAL SWITCHING
BH
R
G
B
CONTRAST BRIGHTNESS CONTROL
BH
R
G
B
DRIVE CONTROL
BI
R
G
B
VIDEO OUT AMP
BK
R
G
B
RED K
GREEN K
BLUE K
CRT
BEAM CURRENT CONTROL
BI
R/R-Y
TEST /G/Y
B/B-Y
OPTION
TEST & COMPONENT & RGB INPUTS
QB ,BA
PAL/PAL-M DECODERS
BD, BM
R-Y
B-Y
(BVM-2015P/PM ONLY)
COLOR GAIN CONTROL
BG
R-Y
G-Y
B-Y
R G B
R-Y
B-Y
COMPONENT
BG
OPTION
DECODE OUT
RGB/ COMPONENT
BF ,V
SYNC SELECT & SYNC SEP.
BA
COMP SYNC
V SYNC
SYNC PRO. & PULSE GEN
BJ
CONTROL PULSES TO Bc~Bk
DECODE OUT
R/R-Y
G/Y
B/B-Y


RED K
GREEN K
BLUE K
CRT

5-2. FRAME WIRING DIAGRAM


V
REMOTE 10P
AUTO/B&W
A/B
TALLY
INT/EXT
REMOTE
VITC OFF
VITC HOLD
GND
TB-6
W
R/R-Y OUT
G/Y OUT
B/B-Y OUT
QA
VIDEO A IN
VIDEO B IN
EXT SYNC IN
QB
R/R-Y IN
TEST/G/Y IN
B/B-Y IN
TB-31
BA
TB-32
B1
BT
* NTSC BVM-1915
TB-33
B2
OPTION
TB-34
B3
OPTION
TB-35
B4
OPTION
TB-36
B5
BC
BD
BM
* NTSC BVM-1915
* PAL BVM-2015P
* PAL-M BVM-2015PM
TB-37
BG
TB-38
BH
TB
TB-8
TB-7
TB-12
TB-9
TB-11
TB-13
TB-10
Y
POWER LED
XB
TALLY
TALLY SW
HA
CONTROL PANEL
HA-301
HA-302
HA-303
HA-304
CNS-1
CNP-1
CNP-3
CNS-3
CNS-2
CNP-2
D.G. COIL
GA
AC RECT DC REG
GB
FUSE
AC INPUT SELECT
AC 220/240
AC 100/120
S901 POWER SW
CNP-4
CNS-4
EA
H. DEF OUT&HV. REG
EA-1
EA-2
EA-3
EA-4
EA-5
EA-6
EA-7
EA-8
EA-9
EA-10
EA-11
EA-12
EA-13
EA-14
EA-15
EA-16
EA-17
EA-18
EA-19
COLLECTOR
DY FOCUS
HB
SYSTEM SWITCH
HB-2
HB-4
HB-5
HB-6
HC
INPUT SELECT
HC-1
HG
CONTROL PANEL.2
HG-1
HG-2
HG-3
HH
CONTROL PANEL.1
HH-1
HH-2
HH-3
HH-4
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

FRAME FRAME



TB-38
TB-39
TB-40
BH
BI
BJ
GC (REG)
GC-1
GC-2
GC-3
BK-5
-150V
GND
-15V
+15V
+12V
-12V
TB-16
TB-17
TB-21
TB-20
TB-19
TB-18
TB-24
TB-23
TB-22
BK-1
BK-2
BK-3
BK-4
BK-9
BK-10
BK-11
BK-12
BK-13
R OUT
R IN
G OUT
G IN
B OUT
B IN
R. DRIVE
G. DRIVE
B. DRIVE
B. W. P
AFC. P
H. V. BLK
R. BW. C
G. BW. C
B. BW. C
BK (VIDEO OUT)
+150V
G1. D
BK-8
BK-7
BK-6
C-4
C-3
C-2
C-1
C-5
C-6
C-7
C-8
C (CRT SOKET)
G2
HEATER
G2. CONT
G4
Y. CONV
+18V
TB-10
TB-14
TB-15
HB-4
HB-1
HB-3
HB SYSTEM SWITCH
HB-6
HB-5
HG CONTROL PANEL.2
HG-1
HG-2
HG-3
HG-4
HG-6
MANUAL SW
HE-3
HE AUTO-SET-UP CONTROL
HE-4
HH-1
HH-2
HH-3
HH-4
HH CONTROL PANEL.1
HF-2
HF-1
HF AUTO-SET-UP PROBE
CONTRAST
BRIGHT
CHROMA
PHASE
COLLECTOR
+B
ABL
+18V
HV. P+
P F.B.T
FOCUS VR
HV
HV REG
HV PROT
HVR
NTC
V DY
H DY
V901
DB-202
DB-201
DB H.D. PULSE-GEN. &AFC
13V
H.D
H. PULSE
H. SAW
H. DL. SW
D. AFC. P
AFC. P
H. SYNC
60/50
DA-6
DA-2
DA-3
DA-5
DA-1
DA-4
DA DEF GEN
H. DELAY
N/U
H. WIDTH
Q. P
HV. D
H. CENT
H. LIN
SET. UP
V. SYNC
H. BLK. P
V. CONV
X. CONV+
V. SAW
EB-2
EB-1
EB 1K PROTECTOR
+150V
P. POT. OUT
V OUT
HV PROT
I. ABL
EC-2
EC-1
EC-3
EC N.T.C-DRIVE
Q. POLE
X. CONV+
-10V C.O
+10V C.O
-18V
V. S. NF
V. S. OUT

5-3. MOUNTING AND SCHEMATIC DIAGRAMS

Note:

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et par une marque ⚠ sont d'une importance critique pour la sécurité. Ne les remplacer que par des pièces de numéro spécifié.

- All capacitors are in μF unless otherwise noted. p : μμF 50 WV or less are not indicated except for electrolytics.
- All resistor are in ohms, 1/2W on the C board and 1/4W on the rest of the boards unless otherwise specified.
  kΩ = 1000Ω, MΩ = 1000kΩ
- ▭ : nonflammable resistor.
- △ : internal component.
- ⏚ : direct connection to points marked ⏚ on the chassis
- ▭ : panel designation.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- The components identified by ☒ in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.
  When replacing components identified by ◪, make the necessary adjustments indicated. If results do not meet the specified value, change the component identified by ☒ and repeat the adjustment until the specified value is achieved.
  Refer to R52, R53, R67, R68, R73, R75, R115, R106, R108, R135
  Adjust on page 4-11 ~ 4-16.
  When replacing the part in below table, be sure to perform the related adjustment.

Reference information

RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	: FUSE	NONFLAMMABLE FUSIBLE
	: RS	NONFLAMMABLE WIREWOUND
	: RB	NONFLAMMABLE CEMENT
COIL	: LF-8L	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: AIR	HIGH RIPPLE

Part replaced (◪)	Adjustment (☒)
IC3, C59, R67, R68, R78, RV2 (GA board)	+B MAX CONFIRMATION (R67, R68) Page 4-11.
Q13, Q14, R52, R53 (GA board) Q3, Q4, Q5, D5, D6, D7, D8, R4, R5, R19, R20, R21, R22 (GB board)	+B PROTECTER (R52, R53) Page 4-11.
IC2, IC3, R61, R62, R71, R72, R73, R74, R75, R88, RV1 (EA board) HVR	HIGH VOLTAGE REGULATOR CONFIRMATION (R73, R75) Page 4-15
IC4, D24, D25, D27, R89, R90, R102, R103, R104, R105, R106, R107, R108, R111, R152 (EB board) HVR	HIGH VOLTAGE HOLD DOWN ADJUSTMENT AND CONFIRMATION (R106, R108) Page 4-14.
IC4, D24, D26, D27, R89, R90, R102, R103, R112, R113, R114, R115, R116, R117, R118, R119, R120, R121, R153 (EB board) FBT (P board)	BEAM CURRENT PROTECTOR-1 CONFIRMATION (R115) Page 4-16.
IC6, D29, D51, R122, R123, R124, R130, R131, R132, R133, R134, R135, R136, R137, R138, R140, R141 (EB board) FBT (P board)	BEAM CURRENT PROTECTOR-2 CONFIRMATION (R135) Page 4-16.

- Voltages are dc with respect to ground unless otherwise noted.
- **Voltage variations may be noted due to normal production tolerances.**
- Reading are taken with a 10 MΩ digital multimeter.
- ▭: adjustment for repair.
- —— : B+ bus.
- – – –: B– bus.
- ⋇ : Can not be measured.
- Readings and waveforms are taken with a color-bar signal input and with a 75Ω terminator connected to an open terminal.

- Switches and controls are set as follows unless otherwise noted.

FRONT PANEL (R)

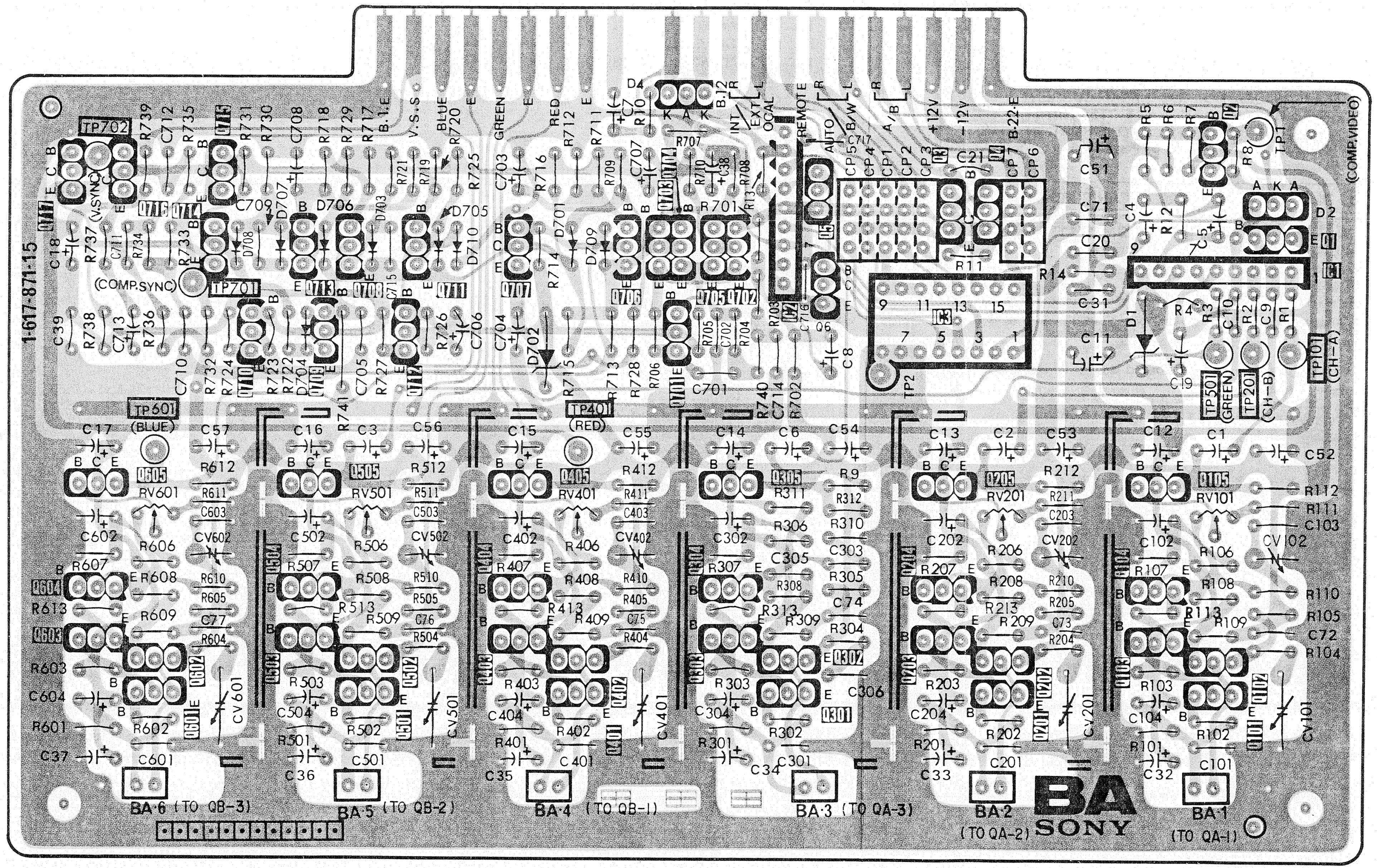
1.	INPUT selector	A	HC board
2.	SYNC selector	INT	
3.	MODE selector	AUTO	
4.	CONTRAST MANUAL switch	PRESET	HG board
5.	BRIGHTNESS MANUAL switch	PRESET	
6.	CHROMA MANUAL switch	PRESET	
7.	PHASE MANUAL switch	PRESET	
8.	SCAN MODE switch		HA board
	▣ UNDER SCAN	NOR	
	◫ H. DELAY	NOR	
	⊟ V. DELAY	NOR	
9.	SCREEN switch (R)	NOR	
10.	SCREEN switch (G)	NOR	
11.	SCREEN switch (B)	NOR	
12.	APT switch	NOR	
13.	BLUE ONLY switch	NOR	
14.	COMB/TRAP filter selector	TRAP	

SUB CONTROL PANEL

15.	INPUT SELECT buttons	B	HB board
16.	COLOR STANDARD buttons	NTSC	
17.	FILTER switch	OFF	
18.	MATRIX switch	OFF	
19.	PAL/SECAM mode selector	D(L)	
20.	WHITE/OPERATE/SET UP selector	OPERATE	
21.	SPRIT SCREEN switch	OFF	
22.	CROSS HATCH switch	OFF	
23.	VITC switch	OFF	
24.	PIC. SET UP switch	OFF	
25.	AFC switch	2m sec	DB board

BA board (SYNC SELECT & SYNC SEP, HOOK UP)

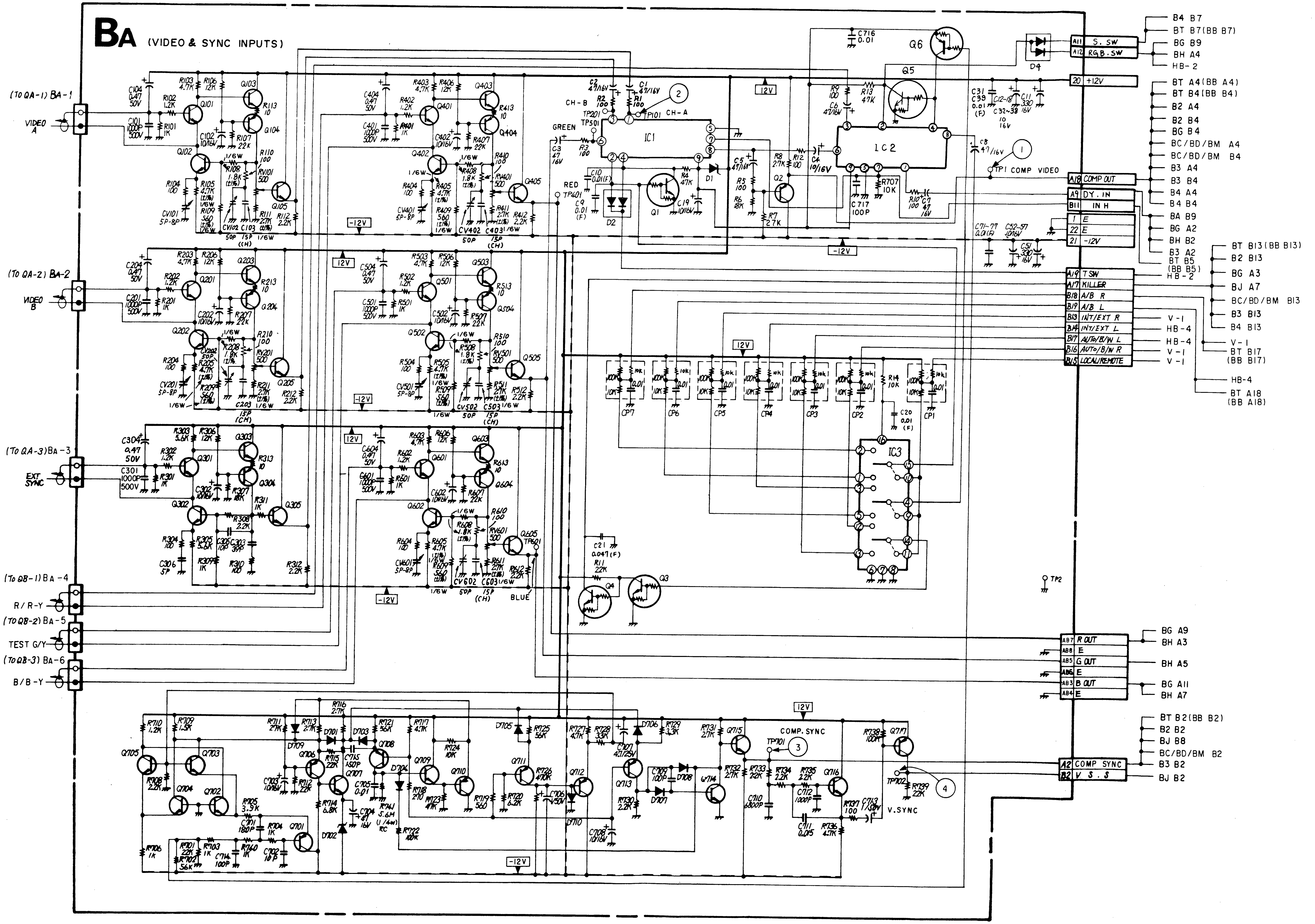
IC	2 3 1
Q	717 716 605 604 603 602 601 715 714 710 713 505 504 503 708 709 502 501 711 712 707 405 404 403 402 401 704 706 703 705 702 701 305 304 303 302 301 5 3 205 204 203 4 202 201 105 104 103 2 102 101 1
D	708 707 706 704 703 705 710 101 709 702 4 1 2
TP ADJ	TP702 TP601 RV601 CV602 CV601 TP701 RV501 CV502 CV501 TR401 RV401 CV402 CV401 TP2 RV201 CV202 CV201 TP501 RV101 TP1 TP201 TP101 CV102 CV101

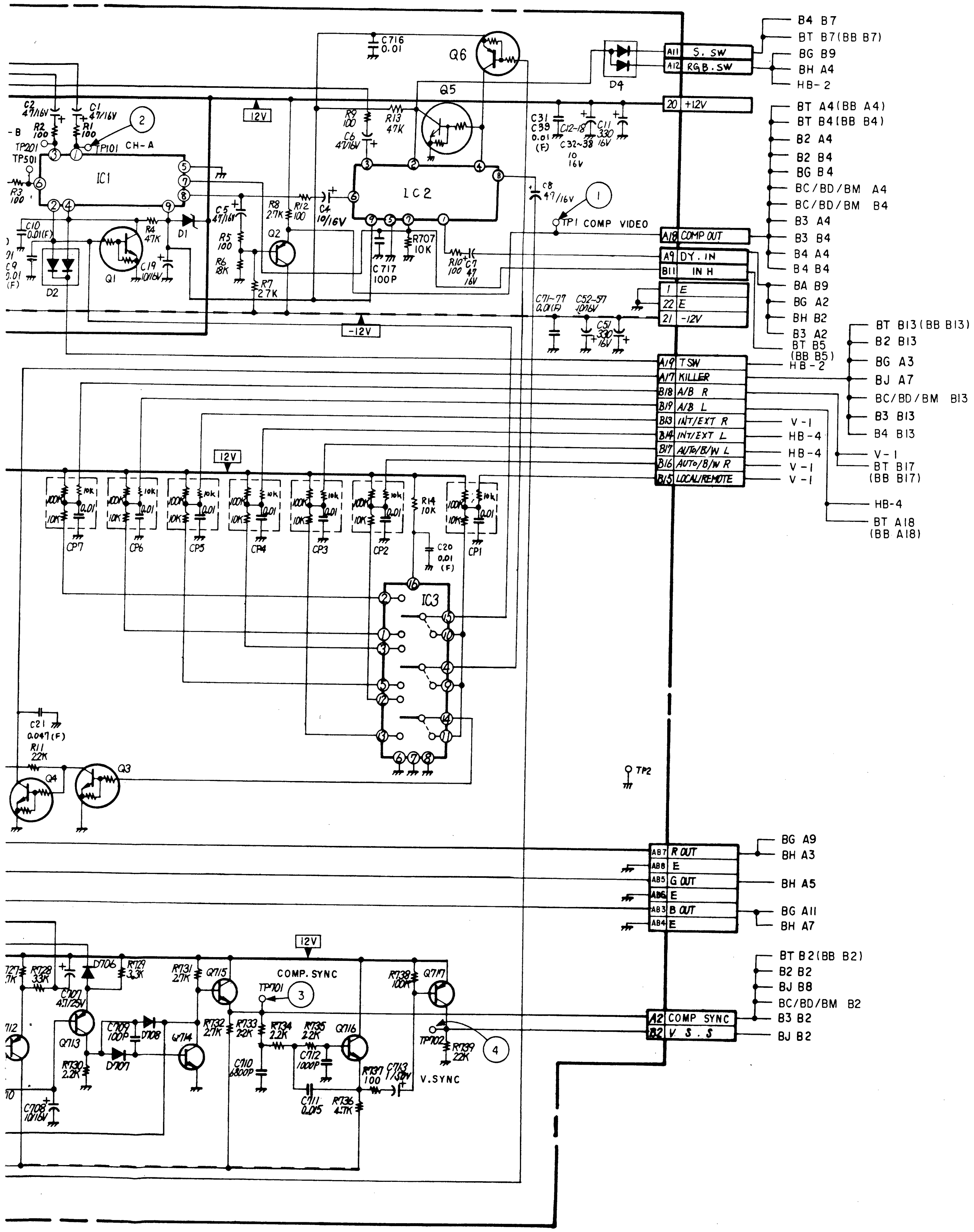


1-617-871-15
TP702
(V.SYNC)
(COMP.SYNC)
TP701
TP601
(BLUE)
TP401
(RED)
V.S.S
BLUE
GREEN
RED
B.12
INT
EXT
LOCAL
REMOTE
AUTO
B/W
A/B
+12V
-12V
B-22
(COMP.VIDEO)
TP1
TP2
TP501
(GREEN)
TP201
(CH-B)
TP101
(CH-A)
BA-6 (TO QB-3)
BA-5 (TO QB-2)
BA-4 (TO QB-1)
BA-3 (TO QA-3)
BA-2 (TO QA-2)
BA-1 (TO QA-1)
BA
SONY

● ▨ : Conductor side pattern
● ▨ : Component side pattern

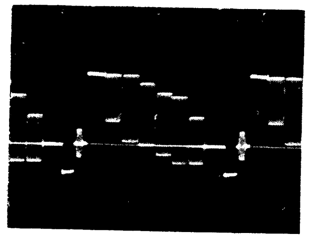
BA board (SYNC SELECT & SYNC SEP, HOOK UP)

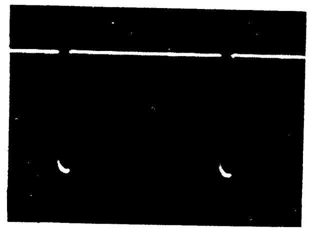

BA (VIDEO & SYNC INPUTS)
(TO QA-1) BA-1
VIDEO A
(TO QA-2) BA-2
VIDEO B
(TO QA-3) BA-3
EXT SYNC
(TO QB-1) BA-4
R/R-Y
(TO QB-2) BA-5
TEST G/Y
(TO QB-3) BA-6
B/B-Y
CH-B
CH-A
GREEN
RED
BLUE
IC1
IC2
IC3
Q1
Q2
Q3
Q4
Q5
Q6
D1
D2
D4
TP1 COMP VIDEO
TP2
COMP. SYNC
TP701
TP702
V.SYNC
CP1
CP2
CP3
CP4
CP5
CP6
CP7
12V
-12V
A11 S.SW
A12 RGB.SW
20 +12V
A18 COMP OUT
A9 DY.IN
B11 INH
1 E
22 E
21 -12V
A19 T.SW
A17 KILLER
B18 A/B R
B19 A/B L
B13 INT/EXT R
B14 INT/EXT L
B17 AUTO/B/W L
B16 AUTO/B/W R
B15 LOCAL/REMOTE
AB7 R OUT
AB8 E
AB5 G OUT
AB6 E
AB3 B OUT
AB4 E
A2 COMP SYNC
B2 V.S.S
B4 B7
BT B7(BB B7)
BG B9
BH A4
HB-2
BT A4(BB A4)
BT B4(BB B4)
B2 A4
B2 B4
BG B4
BC/BD/BM A4
BC/BD/BM B4
B3 A4
B3 B4
B4 A4
B4 B4
BA B9
BG A2
BH B2
B3 A2
BT B5 (BB B5)
HB-2
BT B13(BB B13)
B2 B13
BG A3
BJ A7
BC/BD/BM B13
B3 B13
B4 B13
V-1
HB-4
HB-4
V-1
V-1
V-1
BT B17 (BB B17)
HB-4
BT A18 (BB A18)
BG A9
BH A3
BH A5
BG A11
BH A7
BT B2(BB B2)
B2 B2
BJ B8
BC/BD/BM B2
B3 B2
BJ B2

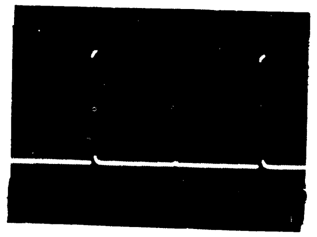

C716 0.01
Q6
Q5
D4
A11 S. SW
A12 RGB.SW
20 +12V
12V
C2 47/16V
C1 47/16V
R2 100
R1 100
TP201
TP101 CH-A
TP501
R3 100
IC1
-B
②
①
C10 0.01(F)
C9 0.01 (F)
D2
Q1
R4 47K
D1
C19 10/16V
C5 47/16V
R5 100
R6 18K
R7 27K
R8 2.7K
R12 100
Q2
R9 100
C6 47/16V
R13 47K
C4 10/16V
IC2
C717 100P
R707 10K
R10 100
C7 47 16V
C31 C39 0.01 (F)
C12~18
C32~38 10 16V
C11 330 16V
C8 47/16V
TP1 COMP VIDEO
A18 COMP OUT
A9 DY. IN
B11 IN H
1 E
22 E
21 -12V
-12V
C71~77 0.01(F)
C52~57 10/16V
C51 330 16V
A19 TSW
A17 KILLER
B18 A/B R
B19 A/B L
B13 INT/EXT R
B14 INT/EXT L
B17 AUTO/B/W L
B16 AUTO/B/W R
B15 LOCAL/REMOTE
B4 B7
BT B7(BB B7)
BG B9
BH A4
HB-2
BT A4(BB A4)
BT B4(BB B4)
B2 A4
B2 B4
BG B4
BC/BD/BM A4
BC/BD/BM B4
B3 A4
B3 B4
B4 A4
B4 B4
BA B9
BG A2
BH B2
B3 A2
BT B5 (BB B5)
HB-2
BT B13(BB B13)
B2 B13
BG A3
BJ A7
BC/BD/BM B13
B3 B13
B4 B13
V-1
HB-4
HB-4
V-1
V-1
V-1
BT B17 (BB B17)
HB-4
BT A18 (BB A18)
CP7
CP6
CP5
CP4
CP3
CP2
CP1
R14 10K
C20 0.01 (F)
IC3
C21 0.047(F)
R11 22K
Q4
Q3
TP2
AB7 R OUT
AB8 E
AB5 G OUT
AB6 E
AB3 B OUT
AB4 E
BG A9
BH A3
BH A5
BG A11
BH A7
R728 33K
D706
R729 3.3K
C707 4.7/25V
Q713
R730 2.2K
C709 100P
D708
D707
C708 10/16V
Q712
R731 2.7K
Q715
Q714
R732 2.7K
COMP. SYNC
TP701
③
R733 22K
R734 2.2K
R735 2.2K
Q716
C710 6800P
C712 1000P
C711 0.015
R736 4.7K
R737 100
C713 1/50V
V.SYNC
R738 100K
Q717
TP702
④
R739 22K
A2 COMP SYNC
B2 V S S
BT B2(BB B2)
B2 B2
BJ B8
BC/BD/BM B2
B3 B2
BJ B2

BA BOARD

IC1	CX894	INPUT SELECT
2	CX894	SYNC SELECT
3	MC14053BCP	LOCAL/REMOTE SW
Q1	DTC144ES	INPUT SELECT CONTROL
2	2SA844	BUFF
3	DTC144ES	KILLER
4	DTC144ES	KILLER
5	DTC144ES	SYNC SELECT CONTROL
6	DTA144ES	INT/EXT CONTROL
101	2SC2668	VIDEO A AMP
102	2SC2668	VIDEO A AMP
103	2SC2668	VIDEO A AMP
104	2SA844	VIDEO A AMP
105	2SC2668	VIDEO A AMP
201	2SC2668	VIDEO B AMP
202	2SC2668	VIDEO B AMP
203	2SC2668	VIDEO B AMP
204	2SA844	VIDEO B AMP
205	2SC2668	VIDEO B AMP
301	2SC2668	EXT SYNC AMP
302	2SC2668	EXT SYNC AMP
303	2SC2668	EXT SYNC AMP
304	2SA844	EXT SYNC AMP
305	2SC2668	EXT SYNC AMP
401	2SC2668	R-Y/R AMP
402	2SC2668	R-Y/R AMP
403	2SC2668	R-Y/R AMP
404	2SA844	R-Y/R AMP
405	2SC2668	R-Y/R AMP
501	2SC2668	TEST/Y/G AMP
502	2SC2668	TEST/Y/G AMP
503	2SC2668	TEST/Y/G AMP
504	2SA844	TEST/Y/G AMP
505	2SC2668	TEST/Y/G AMP
601	2SC2668	B-Y/B AMP
602	2SC2668	B-Y/B AMP
Q603	2SC2668	B-Y/B AMP
604	2SA844-E	B-Y/B AMP
605	2SC2668	B-Y/B AMP
701	2SA1048	SYNC AGC
702	2SC2785	SYNC AGC
703	2SC2785	SYNC AGC
704	2SC2785	SYNC AGC
705	2SC2785	SYNC AGC
706	2SA1115	SYNC AGC
707	2SC3068	SYNC AGC
708	2SA1115	SYNC AGC
709	2SC2785	SYNC AGC
710	2SA1115	SYNC AGC
711	2SA1115	SYNC AGC
712	2SA1115	SYNC AGC
713	2SA1115	COMP SYNC SEP
714	2SC2785	COMP SYNC SEP
715	2SC3068	COMP SYNC SEP
716	2SC3068	V SYNC SEP
717	2SA1115	V SYNC SEP
D1	RD3.0E-B	+9V REG
2	MC921	INPUT SELECT CONTROL
4	MC911	SYNC SELECT CONTROL
701	1SS119	SYNC AGC
702	RD4.3E-B	-7.5V REG
703	1SS119	SYNC AGC
704	1SS119	SYNC AGC
705	1SS119	SYNC AGC
706	1SS119	SYNC AGC
707	1SS119	COMP SYNC SEP
708	1SS119	COMP SYNC SEP
709	1SS119	SYNC AGC
710	1SS119	SYNC AGC

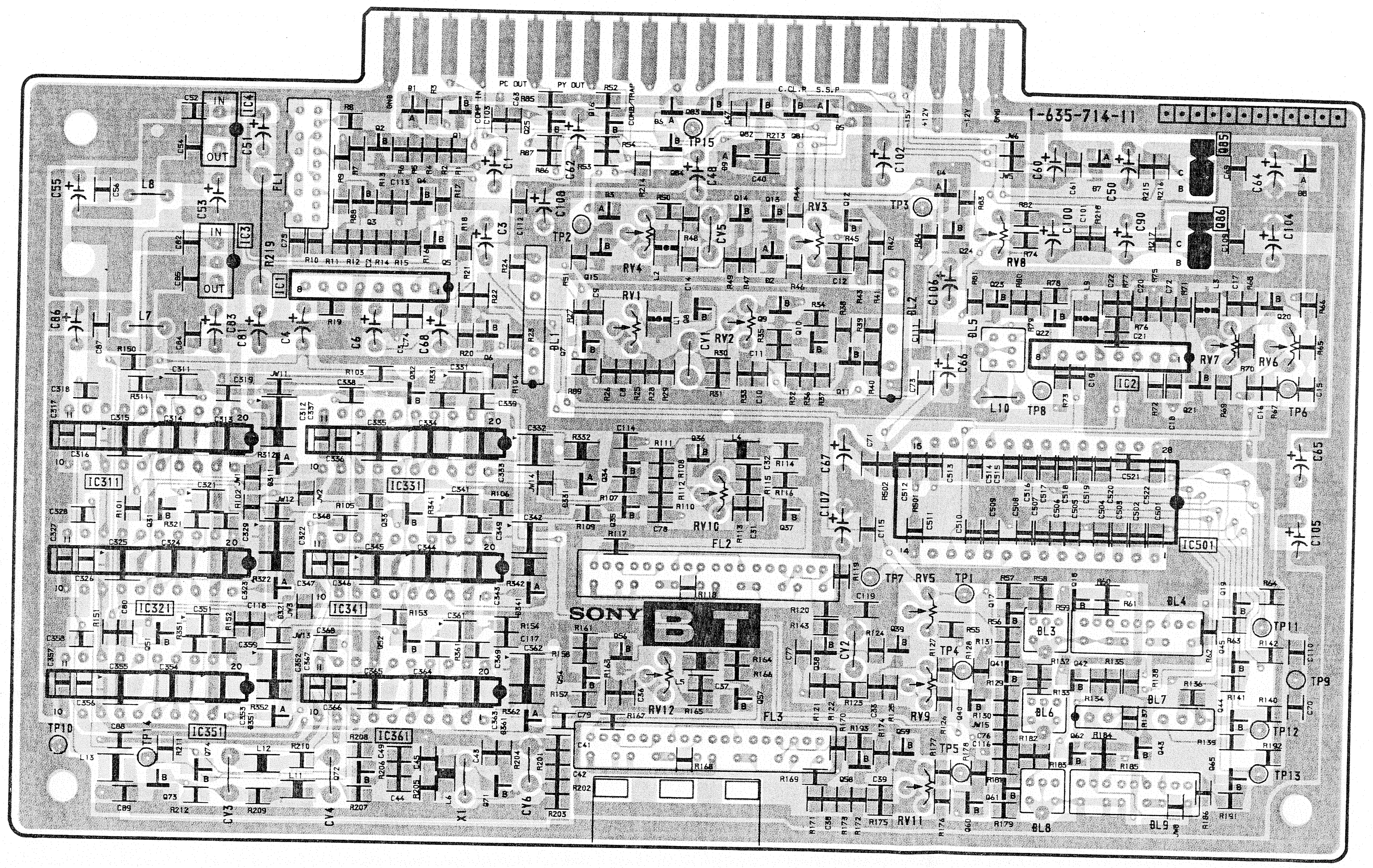

① 1Vp-p (H)
② 1Vp-p (H)


③ 12Vp-p (H)


④ 12 Vp-p (V)

BT board (3 LINE DYNAMIC COMB FILTER, 2 LINE SIMPLE COMB FILTER, BPF) (BVM-1915 ONLY)

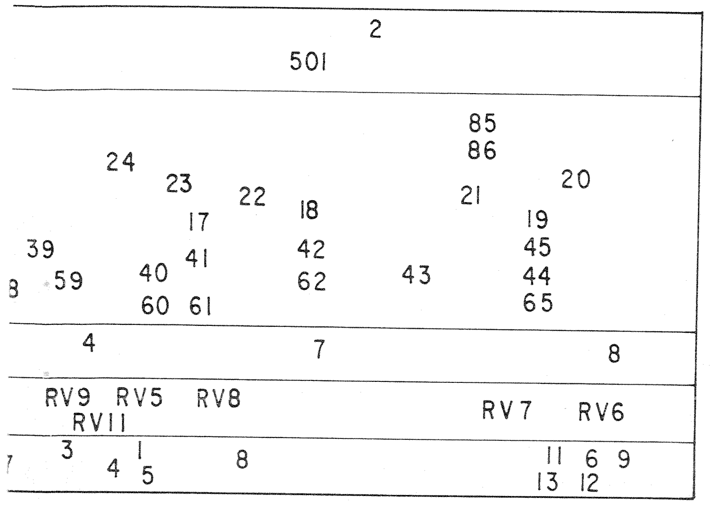
IC	4 3 · 1 · 331 341 361 · 501 · 2
Q	73 · 74 · 2 3 · 72 · 1 · 4 · 5 · 32 33 52 · 6 · 71 · 25 · 7 · 54 · 16 · 15 · 34 35 56 · 84 · 83 · 8 · 36 · 14 · 82 · 57 · 13 · 81 · 9 · 10 · 37 · 38 · 12 11 · 58 · 39 · 59 · 24 · 40 60 · 23 · 17 · 41 · 61 · 22 · 18 42 62 · 43 · 21 · 85 86 · 19 45 44 65 · 20
D	1 · 341 361 · 331 · 3 · 6 · 9 · 2 · 5 · 4 · 7 · 8
ADJ	CV3 · CV4 · CV6 · RV1 · RV4 · RV12 · CV5 · CV1 · RV2 · RV10 · RV3 · CV2 · RV9 · RV11 · RV5 · RV8 · RV7 · RV6
TP	10 · 14 · 2 · 7 · 3 · 4 · 1 5 · 8 · 11 13 · 6 12 · 9

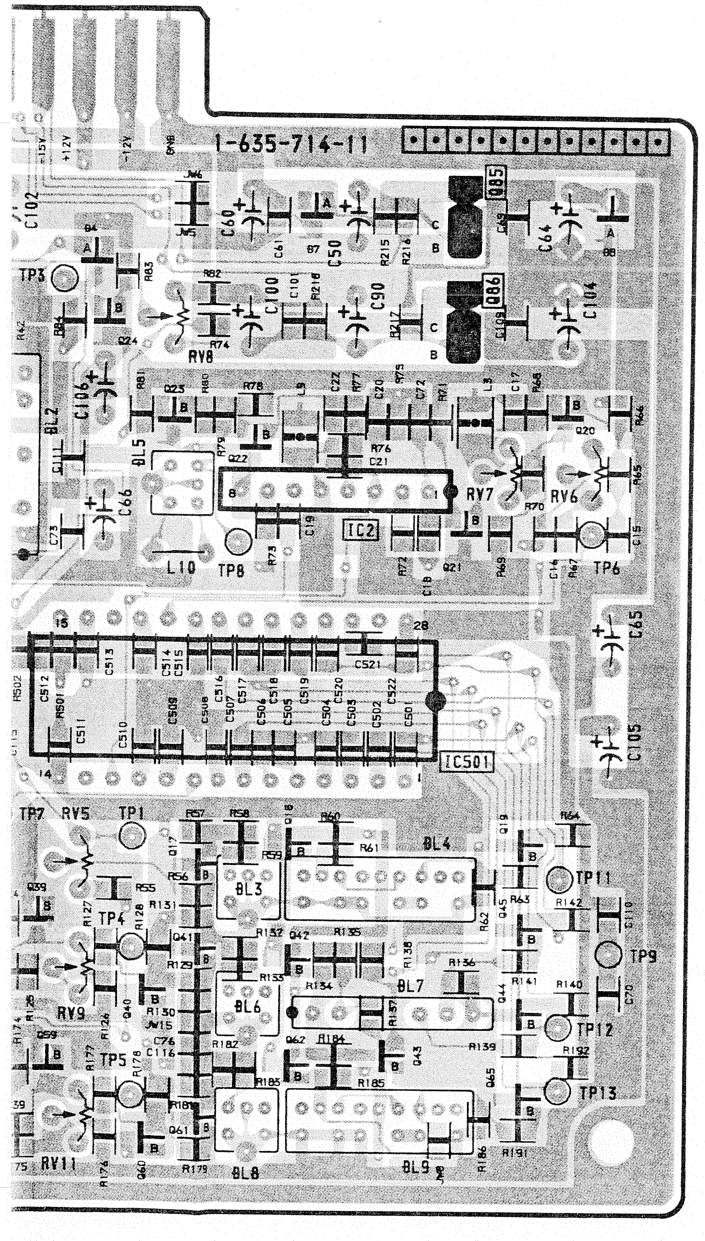

1-635-714-11
SONY
BT
PC OUT
PY OUT
COMB/TRAP
C.CL.R
S.S.P
IN
OUT
IC1
IC2
IC3
IC4
IC311
IC321
IC331
IC341
IC351
IC361
IC501
FL1
FL2
FL3
BL1
BL2
BL3
BL4
BL5
BL6
BL7
BL8
BL9
TP1
TP2
TP3
TP4
TP5
TP6
TP7
TP8
TP9
TP10
TP11
TP12
TP13
TP14
TP15
RV1
RV2
RV3
RV4
RV5
RV6
RV7
RV8
RV9
RV10
RV11
RV12
CV1
CV2
CV3
CV4
CV5
CV6
Q85
Q86
X1
+12V
-12V
+15V

BT board

IC1	Y SELECT	23	BF
2	C SELECT	24	BF
3	9V REG	25	BU
4	5V REG	32	1H
331	CCD	33	1H
341	CCD	34	1H
361	CCD	35	1H
501	CORRELATION	36	1H
Q1	BUFFER	37	AM
2	BUFFER	38	AM
3	AMP	39	AM
4	AMP	40	AM
5	AMP	41	BF
6	Y DELAY	42	BF
7	Y DELAY	43	BF
8	Y DELAY	44	BF
9	Y/C MIX	45	BF
10	Y/C MIX	52	1H
11	Y AMP & BUFFER	54	1H
12	Y AMP & BUFFER	56	1H
13	Y AMP & BUFFER	57	AM
14	Y DELAY	58	AM
15	Y DELAY	59	AM
16	BUFFER & SW	60	AM
17	BPF 140 nsec (NTSC) 110 nsec (PAL)	61	BF
18	BPF 140 nsec (NTSC) 110 nsec (PAL)	62	BF
19	BPF 140 nsec (NTSC) 110 nsec (PAL)	65	BF
20	S COMB C LEVEL,PHASE	71	X'
21	S COMB C LEVEL,PHASE	72	X'
22	BPF,BUFFER	73	X'

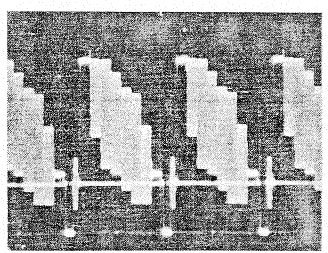
- ● ▨ : Conductor side pattern
- ● ▨ : Component side pattern

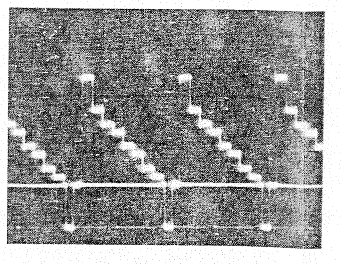

2
501
85
86
24
23
22
18
21
20
17
19
39
41
42
45
59
40
62
43
44
60
61
65
4
7
8
RV9
RV5
RV8
RV11
RV7
RV6
3
1
4
5
8
11
6
9
13
12

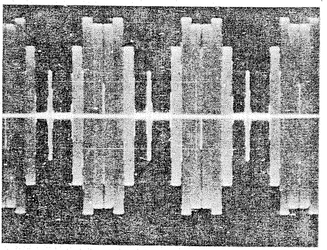

1-635-714-11
TP3
RV8
BL2
BL5
L10
TP8
IC2
RV7
RV6
TP6
IC501
TP7
RV5
TP1
BL3
BL4
TP11
TP4
TP9
RV9
BL6
BL7
TP12
TP5
TP13
RV11
BL8
BL9

BT board

IC1	Y SELECT	23	BPF,BUFFER	74	X'TAL OSC
2	C SELECT	24	BPF,BUFFER	81	SW CONTROL
3	9V REG	25	BUFFER & SW	82	SW CONTROL
4	5V REG	32	1H DELAY (NTSC) 2H DELAY (PAL)	83	SW CONTROL
331	CCD	33	1H DELAY (NTSC) 2H DELAY (PAL)	84	SW CONTROL
341	CCD	34	1H DELAY (NTSC) 2H DELAY (PAL)	85	SW CONTROL
361	CCD	35	1H DELAY (NTSC) 2H DELAY (PAL)	86	SW CONTROL
501	CORRELATION	36	1H DELAY (NTSC) 2H DELAY (PAL)	D1	SW
Q1	BUFFER	37	AMP	2	DC SHIFT
2	BUFFER	38	AMP	3	SW
3	AMP	39	AMP	4	SW
4	AMP	40	AMP	5	SW CONTROL
5	AMP	41	BPF 140 ns DELAY (NTSC) 110 ns DELAY (PAL)	6	SW CONTROL
6	Y DELAY	42	BPF 140 ns DELAY (NTSC) 110 ns DELAY (PAL)	7	SW CONTROL
7	Y DELAY	43	BPF 140 ns DELAY (NTSC) 110 ns DELAY (PAL)	8	SW CONTROL
8	Y DELAY	44	BPF 140 ns DELAY (NTSC) 110 ns DELAY (PAL)	9	SW CONTROL
9	Y/C MIX	45	BPF 140 ns DELAY (NTSC) 110 ns DELAY (PAL)	321	CLAMP
10	Y/C MIX	52	1H DELAY (NTSC) 2H DELAY (PAL)	331	CLAMP
11	Y AMP & BUFFER	54	1H DELAY (NTSC) 2H DELAY (PAL)	341	CLAMP
12	Y AMP & BUFFER	56	1H DELAY (NTSC) 2H DELAY (PAL)	361	CLAMP
13	Y AMP & BUFFER	57	AMP		
14	Y DELAY	58	AMP		
15	Y DELAY	59	AMP		
16	BUFFER & SW	60	AMP		
17	BPF 140 nsec (NTSC) 110 nsec (PAL)	61	BPF 140 ns DELAY (NTSC) 110 ns DELAY (PAL)		
18	BPF 140 nsec (NTSC) 110 nsec (PAL)	62	BPF 140 ns DELAY (NTSC) 110 ns DELAY (PAL)		
19	BPF 140 nsec (NTSC) 110 nsec (PAL)	65	BPF 140 ns DELAY (NTSC) 110 ns DELAY (PAL)		
20	S COMB C LEVEL,PHASE	71	X'TAL OSC		
21	S COMB C LEVEL,PHASE	72	X'TAL OSC		
22	BPF,BUFFER	73	X'TAL OSC		


① 1.1 Vp-p(H)

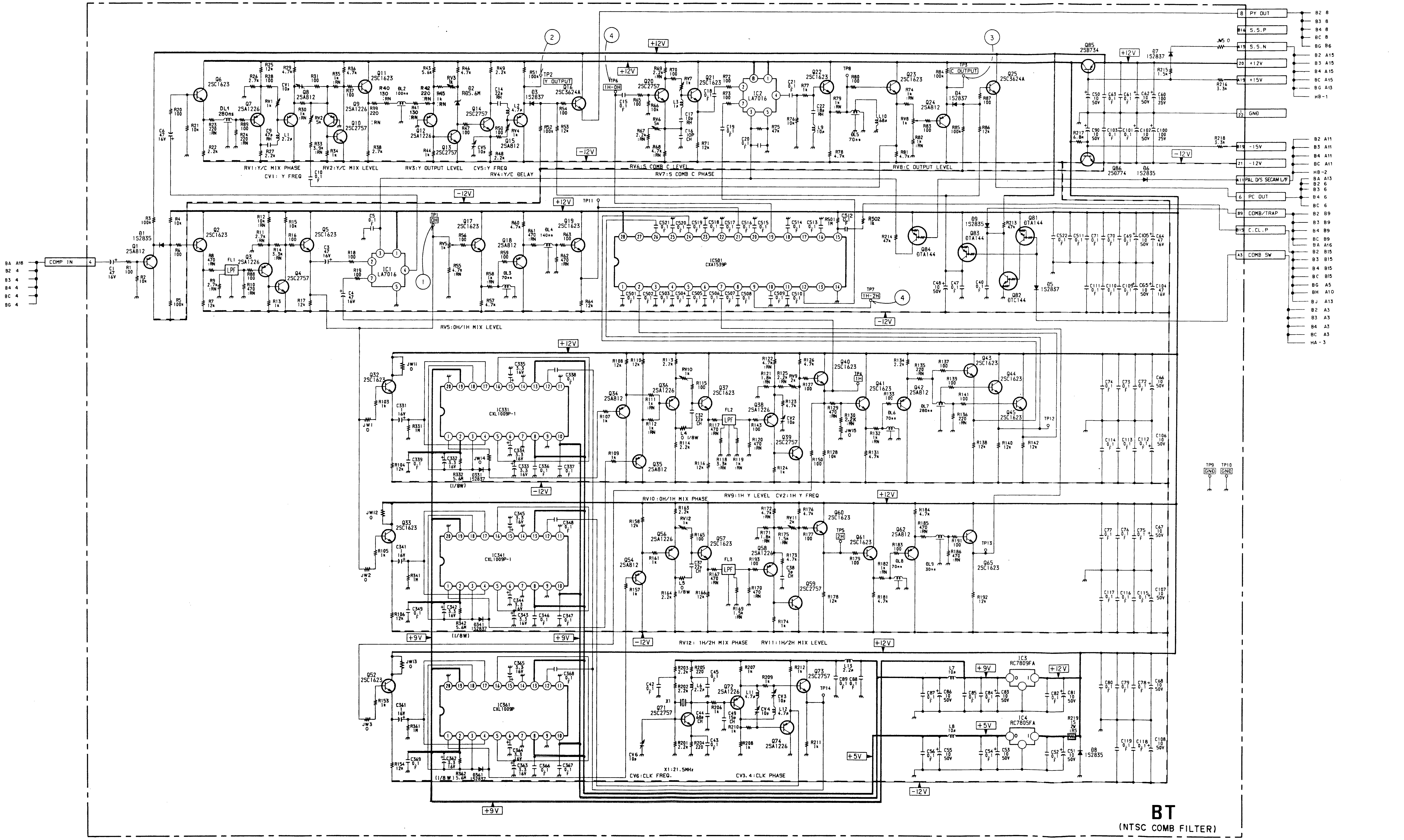

② 0.95 Vp-p(H)


③ 0.58 Vp-p(H)

④ 1.9 Vp-p(H)

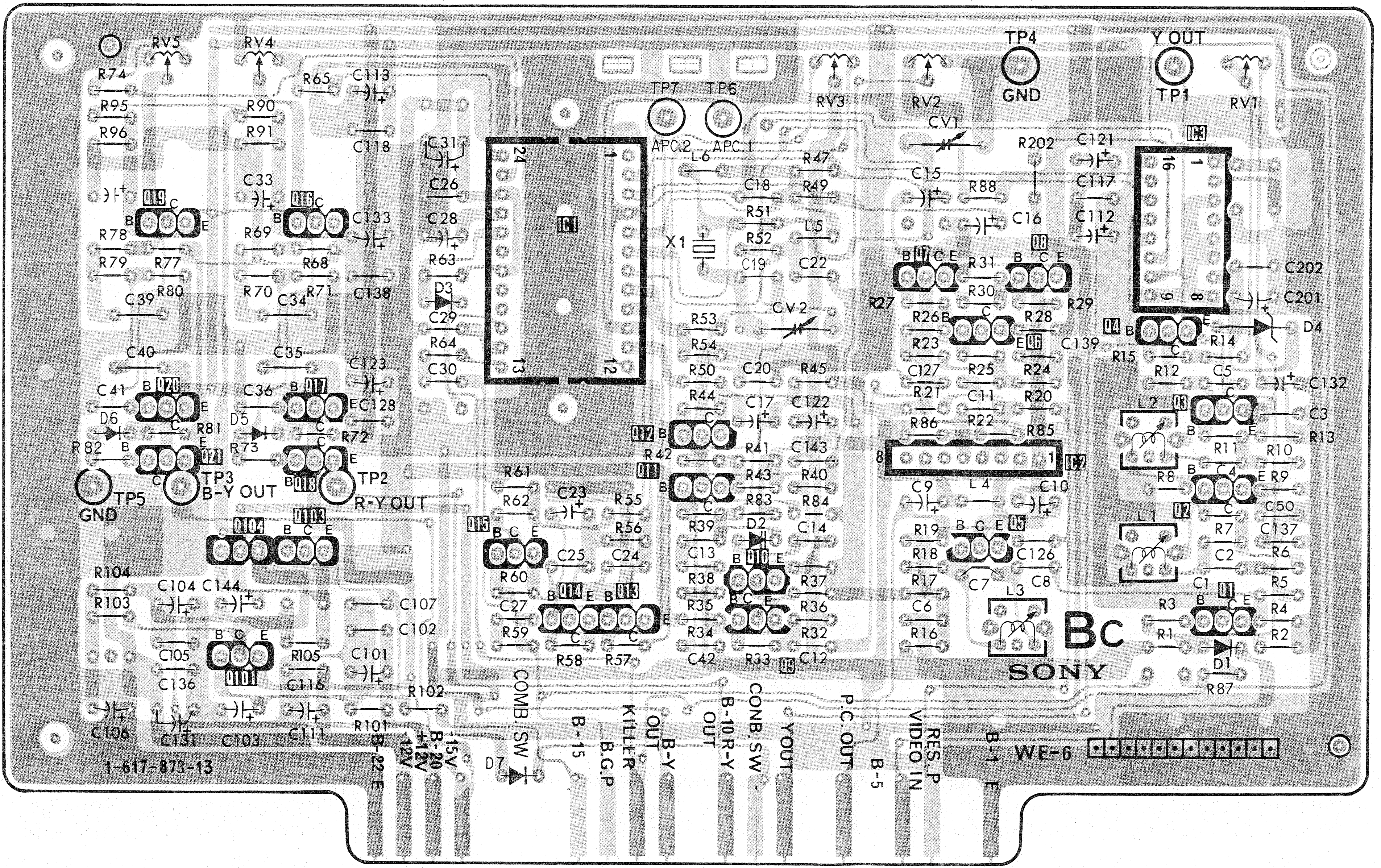
- ▨ : Conductor side pattern
- ▨ : Component side pattern

BT board (3 LINE DYNAMIC COMB FILTER, 2 LINE SIMPLE COMB FILTER, BPF) (BVM-1915 ONLY)


COMP IN
PY OUT
S.S.P
S.S.N
+12V
+15V
GND
-15V
-12V
PAL D/S SECAM L/F
PC OUT
COMB/TRAP
C.CL.P
COMB SW
Y OUTPUT
C OUTPUT
1H-0H
1H-2H
IC1 LA7016
IC2 LA7016
IC501 CXA1539P
IC331 CXL1009P-1
IC341 CXL1009P-1
IC361 CXL1009P
IC3 RC7809FA
IC4 RC7805FA
RV1:Y/C MIX PHASE
RV2:Y/C MIX LEVEL
RV3:Y OUTPUT LEVEL
CV5:Y FREQ
RV4:Y/C DELAY
CV1: Y FREQ
RV6:S COMB C LEVEL
RV7:S COMB C PHASE
RV8:C OUTPUT LEVEL
RV5:0H/1H MIX LEVEL
RV10:0H/1H MIX PHASE
RV9:1H Y LEVEL
CV2:1H Y FREQ
RV12: 1H/2H MIX PHASE
RV11:1H/2H MIX LEVEL
X1:21.5MHz
CV6:CLK FREQ.
CV3.4:CLK PHASE
+9V
+5V
BT
(NTSC COMB FILTER)

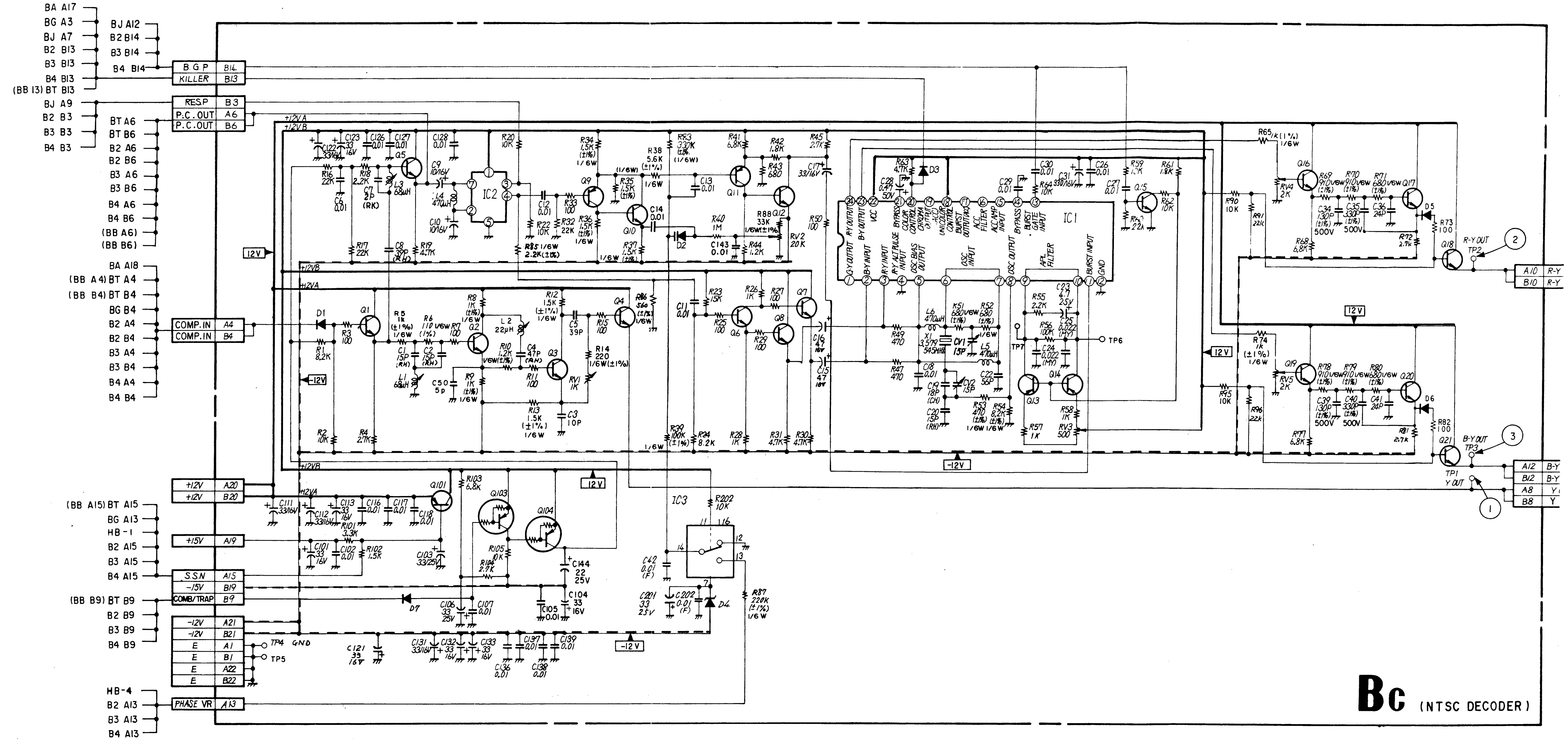
BC Board (NTSC DECODER Y.TRAP) (BVM-1915 ONLY)

IC	1, 2, 3
Q	19 20 21, 104 101, 16 17 18 103, 15, 14, 13, 12 11, 10 9, 7, 6 5, 8, 4, 3 2 1
D	6, 5, 3, 7, 2, 1, 4
TP ADJ	TP5, RV5, TP3, RV4, TP2, TP7, TP6, CV2, RV3, RV2, CV1, TP4, TP1, RV1


RV5
RV4
R74
R95
R96
R65
C113
R90
R91
C118
C31
C26
C28
R63
D3
C29
R64
C30
IC1
24
1
13
12
TP7
TP6
APC.2
APC.1
L6
X1
R47
R49
C18
R51
R52
L5
C19
C22
CV2
RV3
RV2
CV1
TP4
GND
Y OUT
TP1
RV1
R202
C121
C117
C112
C15
R88
C16
IC3
16
1
9
8
C202
C201
D4
Q7
Q8
R31
R30
R27
R29
R26
R28
R23
Q6
C139
R15
Q4
R14
R12
C5
C132
C127
R25
R24
R21
C11
R20
R86
R22
R85
IC2
L2
Q3
C3
R13
R11
R10
R8
C4
R9
Q2
L1
R7
C50
C137
C2
R6
C9
L4
C10
R19
Q5
R18
C126
R17
C7
C8
L3
C6
R16
Bc
SONY
C1
R5
R3
Q1
R4
R1
R2
D1
R87
WE-6
Q19
Q16
C33
C133
R78
R69
R79
R77
R68
R70
C34
R71
C138
C39
R80
C40
C35
C41
Q20
C36
Q17
C123
C128
D6
R81
D5
R72
R82
Q21
R73
Q18
TP3
B-Y OUT
TP2
R-Y OUT
TP5
GND
Q104
Q103
R61
R62
C23
R55
R56
Q15
C25
C24
R60
C27
Q14
Q13
R59
R58
R57
Q12
Q11
R42
R53
R54
R50
C20
R45
R44
C17
C122
R41
C143
R43
R40
R83
R84
R39
D2
C14
C13
Q10
R38
R37
R35
R36
R34
R32
C42
R33
Q9
C12
R104
R103
C104
C144
C107
C102
C105
Q101
R105
C101
C136
C116
R102
C106
C131
C103
C111
R101
1-617-873-13
B-22
E
-12V
+12V
B-20
-15V
D7
COMB. SW
B-15
KILLER
B.G.P
B-Y OUT
B-10 R-Y OUT
CONB. SW.
YOUT
P.C. OUT
B-5
RES. P
VIDEO IN
B-1
E

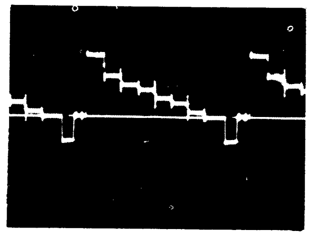
● ▨ : Conductor side pattern
● ▨ : Component side pattern

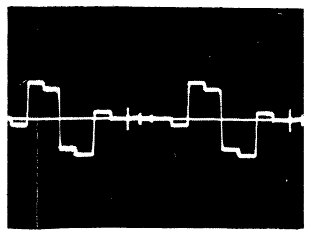
BC Board (NTSC DECODER Y.TRAP) (BVM-1915 ONLY)

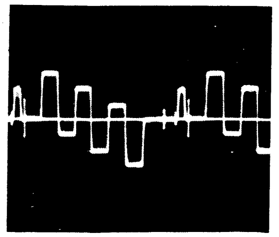

BA A17
BG A3
BJ A7
B2 B13
B3 B13
B4 B13
(BB 13) BT B13
BJ A9
B2 B3
B3 B3
B4 B3
BJ A12
B2 B14
B3 B14
B4 B14
BGP B14
KILLER B13
RESP B3
P.C.OUT A6
P.C.OUT B6
BT A6
BT B6
B2 A6
B2 B6
B3 A6
B3 B6
B4 A6
B4 B6
(BB A6)
(BB B6)
BA A18
(BB A4) BT A4
(BB B4) BT B4
BG B4
B2 A4
B2 B4
B3 A4
B3 B4
B4 A4
B4 B4
COMP.IN A4
COMP.IN B4
(BB A15) BT A15
BG A13
HB-1
B2 A15
B3 A15
B4 A15
(BB B9) BT B9
B2 B9
B3 B9
B4 B9
+12V A20
+12V B20
+15V A19
S.S.N A15
-15V B19
COMB/TRAP B9
-12V A21
-12V B21
E A1
E B1
E A22
E B22
TP4 GND
TP5
HB-4
B2 A13
B3 A13
B4 A13
PHASE VR A13
+12VA
+12VB
12V
-12V
IC1
IC2
IC3
TP1
TP2
TP3
TP6
TP7
R-Y OUT
B-Y OUT
Y OUT
A10 R-Y
B10 R-Y
A12 B-Y
B12 B-Y
A8 Y
B8 Y
①
②
③
Bc (NTSC DECODER)

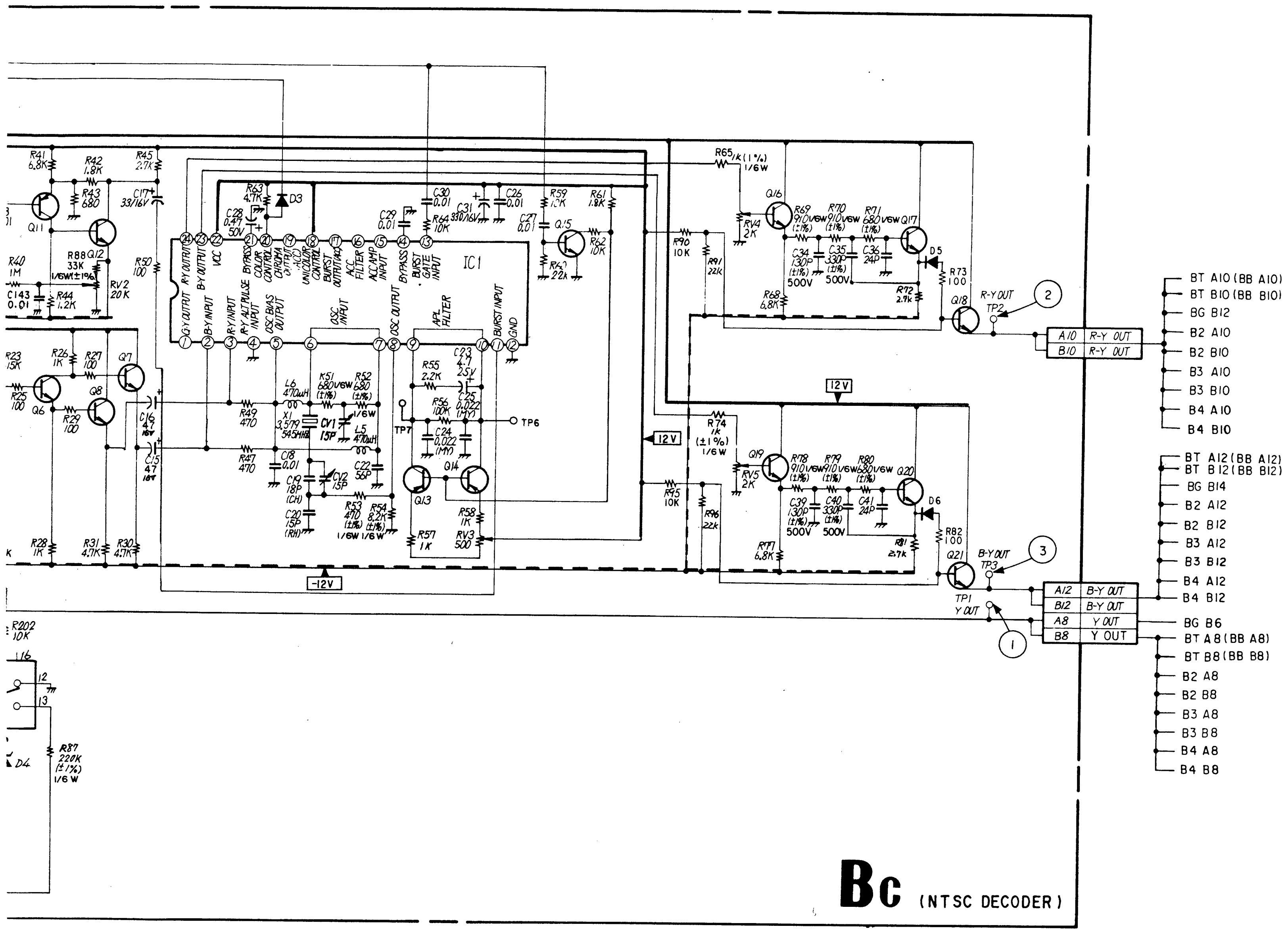
BC BOARD

IC1	TA7193P	DEMODULATOR
2	CX20061	RESIDUAL SWITCH
3	MC14053BCP	ANALOG SWITCH
Q1	2SC403SP	BUFF.
2	2SC403SP	ACTIVE FILTER
3	2SC403SP	Y-DELAY CORRECT
4	2SC3068	BUFF.
5	2SC3068	BUFF.
6	2SC403SP	AMP.
7	2SC403SP	BUFF.
8	2SC403SP	BUFF.
9	2SA844	PHASE CONTROL
10	2SC403SP	PHASE CONTROL
11	2SA844	PHASE CONTROL
12	2SC403SP	PHASE CONTROL
13	2SA844	APL FILTER
14	2SA844	APL FILTER
15	2SC403SP	APL FILTER
16	2SC403SP	LOW PASS FILTER
17	2SC403SP	LOW PASS FILTER
18	2SC3068	BUFF.
19	2SC403SP	LOW PASS FILTER
20	2SC403SP	LOW PASS FILTER
21	2SC3068	BUFF.
101	2SB734	SYSTEM SW.
103	DTA124ES	COMB. SWITCH
104	DTA124ES	COMB. SWITCH
D1	1SS119	SYSTEM SWITCH
2	1T25	PHASE CONTROL
3	1SS119	KILLER SWITCH
4	RD9.1EB3	SWITCH BIAS.
5	1SS119	SYSTEM SWITCH
6	1SS119	SYSTEM SWITCH
7	1SS119	PROTECTOR

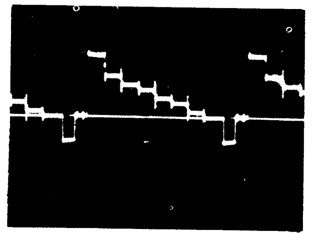

① 1Vp-p (H)


② 0.3Vp-p (H)

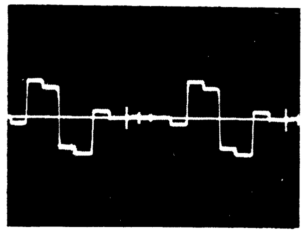

③ 0.36 Vp-p (H)


IC1
Q11
Q12
Q7
Q8
Q6
Q13
Q14
Q15
Q16
Q17
Q18
Q19
Q20
Q21
D3
D5
D6
TP1
TP2
TP3
TP6
TP7
12V
12V
-12V
R-Y OUT
B-Y OUT
Y OUT
A10 R-Y OUT
B10 R-Y OUT
A12 B-Y OUT
B12 B-Y OUT
A8 Y OUT
B8 Y OUT
BT A10 (BB A10)
BT B10 (BB B10)
BG B12
B2 A10
B2 B10
B3 A10
B3 B10
B4 A10
B4 B10
BT A12 (BB A12)
BT B12 (BB B12)
BG B14
B2 A12
B2 B12
B3 A12
B3 B12
B4 A12
B4 B12
BG B6
BT A8 (BB A8)
BT B8 (BB B8)
B2 A8
B2 B8
B3 A8
B3 B8
B4 A8
B4 B8
①
②
③

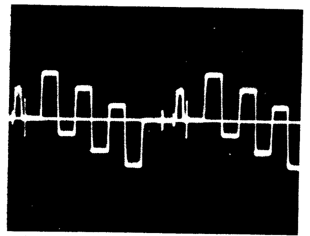
Bc (NTSC DECODER)



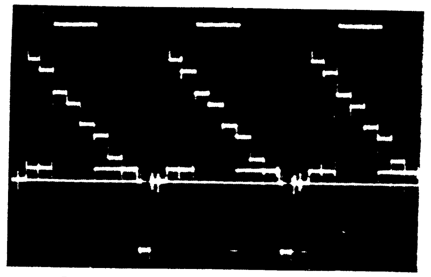
① 1Vp-p (H)



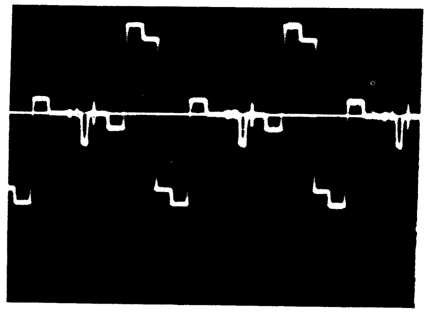
② 0.3Vp-p (H)



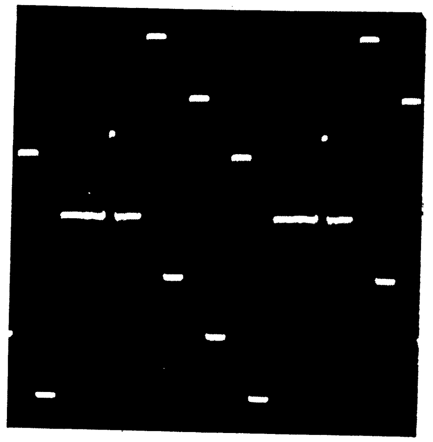
③ 0.36 Vp-p (H)



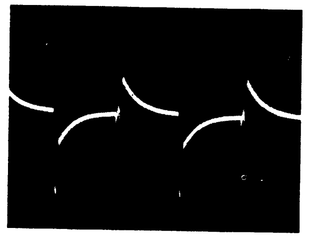
① 1Vp-p (H)



② 0.3Vp-p
④ 0.32Vp-p
③ 0.32Vp-p
⑤ 0.36Vp-p



⑥ 0.38Vp-p
⑧ 0.39Vp-p
⑦ 0.38Vp-p
⑨ 0.42Vp-p

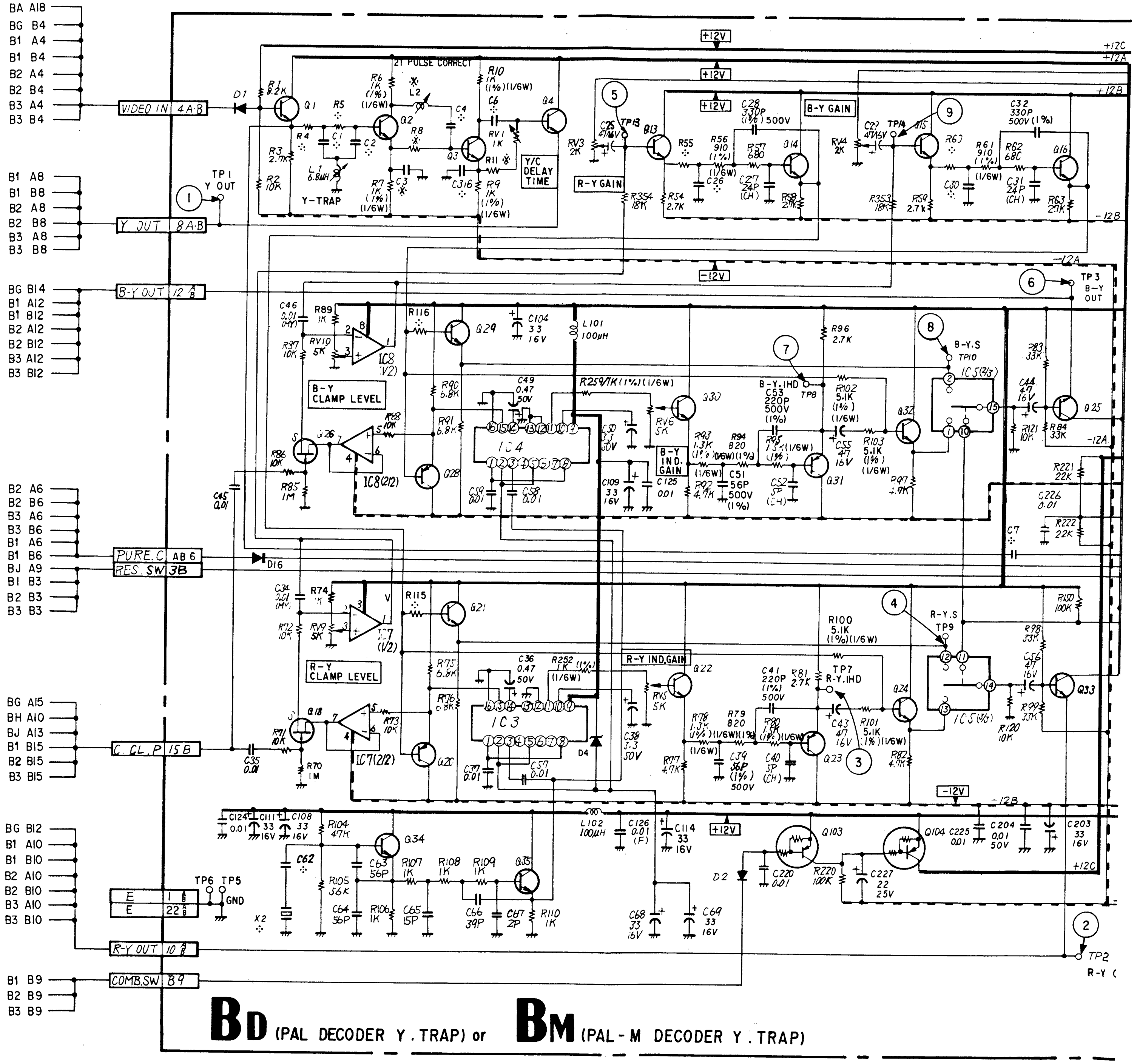


⑩ 0.26Vp-p (H)
⑪ 0.26Vp-p (H)

* NOTE

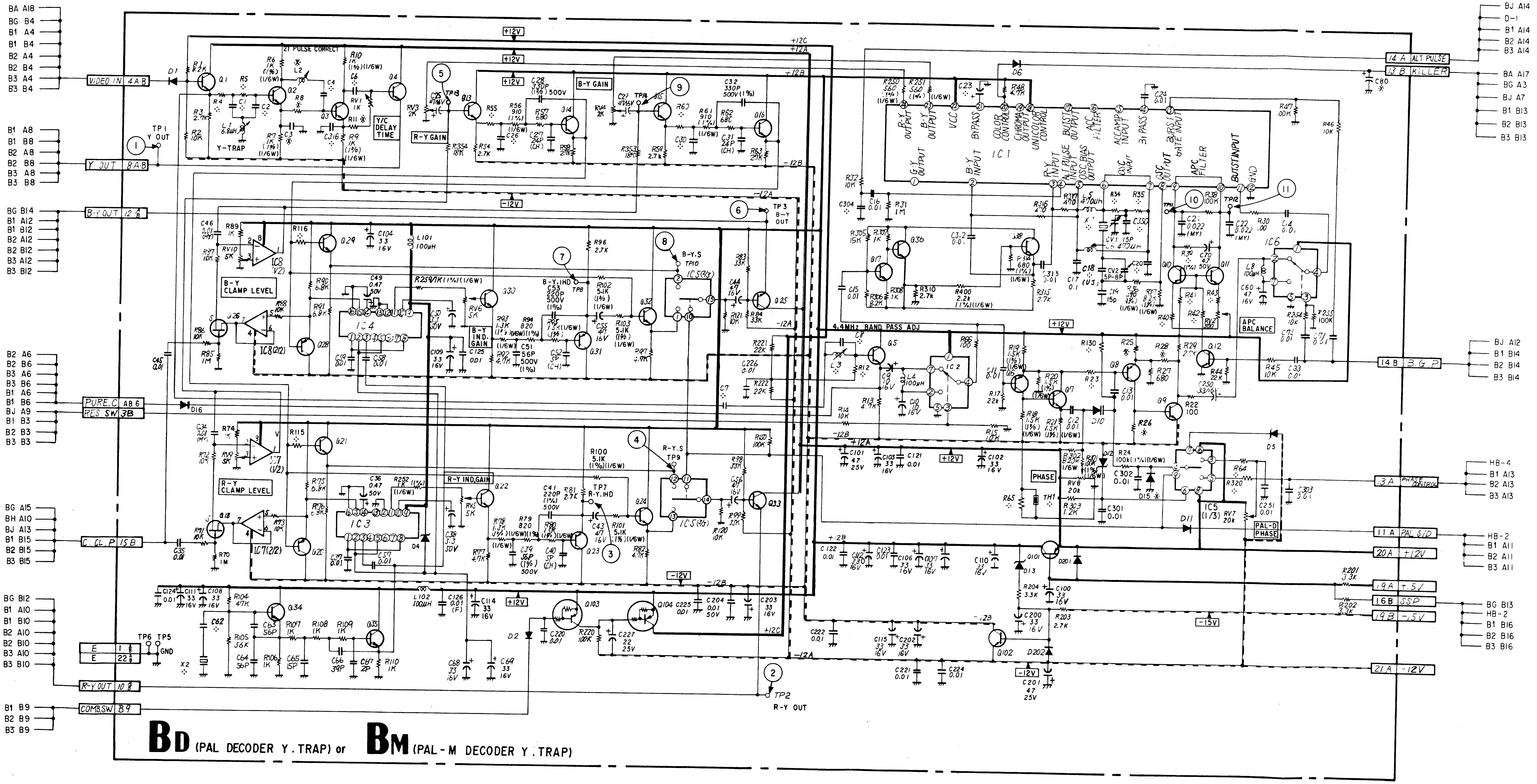
Model Ref	BD (PAL)	BM (PAL-M)
C1	10P 0.5P 50V	15P 5% 50V
C2	10P 0.5P 50V	15P 5% 50V
C3	33PF 5% 50V	–
C4	47P 5% 50V	39P 5% 50V
C6	68P 5% 50V	56P 5% 50V
C7	33P 5% 50V	39P 5% 50V
C8	6P 0.5P 50V	2P 0.25P 50V
C18	13P 5% 50V	15P 5% 50V
C20	68P 5% (UJ) 50V	56P 5% (UJ) 50V
C23	ELECT 1 20% 50V	FILM 0.01 5% 50V
C26	160P 1% 500V	130P 1% 500V
C30	160P 1% 500V	130P 1% 500V
C62	24P 5% 50V	JW
C80	–	1 20% 50V
C304	10P 0.5P 50V	–
C316	2P 0.25P 50V	10P 0.5P 50V
C350	33P 5% (UJ) 50V	22P 5% (UJ) 50V
D15	–	1SS119
L2	1-408-532-00	1-408-514-00
L3	1-408-514-00	1-408-533-00
Q10,11, 20,28	2SA1175-HFE	2SA844
R4	1.5K 1% 1/6W	1K 1% 1/6W
R5	82 1% 1/6W	110 1% 1/6W
R8	1.2K 1% 1/6W	1.8K 1% 1/6W
R11	56 1% 1/6W	130 1% 1/6W
R12	1.8K 1% 1/6W	2.2K 1% 1/6W
R23	6.8K 1% 1/6W	5.6K 1% 1/6W
R25	6.8K 5% 1/4W	4.7K 5% 1/4W
R26	680 5% 1/4W	1.2K 5% 1/4W
R28	1.8K 5% 1/4W	3.3K 5% 1/4W
R34	270 1% 1/6W	680 1% 1/6W
R35	270 1% 1/6W	680 1% 1/6W
R39	1.5K 1% 1/6W	2.2K 1% 1/6W
R40	1K 1% 1/6W	1K 5% 1/4W
R41	2.2K 1% 1/6W	2.2K 5% 1/4W
R42	10K 1% 1/6W	10K 5% 1/4W
R43	1K 1% 1/6W	1K 5% 1/4W
R55	750 1% 1/6W	910 1% 1/6W
R60	750 1% 1/6W	910 1% 1/6W
R64	220K 1% 1/6W	1K 5% 1/4W
R65	3.9K 1% 1/6W	2.2K 1% 1/6W
R115	5.1K 1% 1/6W	2.2K 1% 1/6W
R116	5.1K 1% 1/6W	2.2K 1% 1/6W
R130	220K 1% 1/6W	470K 1% 1/6W
R320	130K 1% 1/6W	360K 1% 1/6W
TH1	–	THERMISTOR 10K
X1	4.43 MHz	3.58 MHz
X2	10.64 MHz	10.717 MHz

BD Board (PAL DECODER Y.TRAP) (BVM-2015P ONLY)
BM Board (PAL-M DECODER Y.TRAP) (BVM-2015PM ONLY)


VIDEO IN 4A B
Y OUT 8A B
B-Y OUT 12 A B
PURE.C AB 6
RES.SW 3B
C.CL.P 15B
R-Y OUT 10 B
COMB.SW B9
E 1
E 22
TP1 Y OUT
TP2 R-Y
TP3 B-Y OUT
TP5
TP6
GND
TP7 R-Y.IHD
TP8 B-Y.IHD
TP9 R-Y.S
TP10 B-Y.S
2T PULSE CORRECT
Y-TRAP
Y/C DELAY TIME
R-Y GAIN
B-Y GAIN
B-Y CLAMP LEVEL
R-Y CLAMP LEVEL
B-Y IND. GAIN
R-Y IND.GAIN
IC3
IC4
IC5
IC7
IC8
+12V
-12V
+12A
-12A
+12B
-12B
+12C

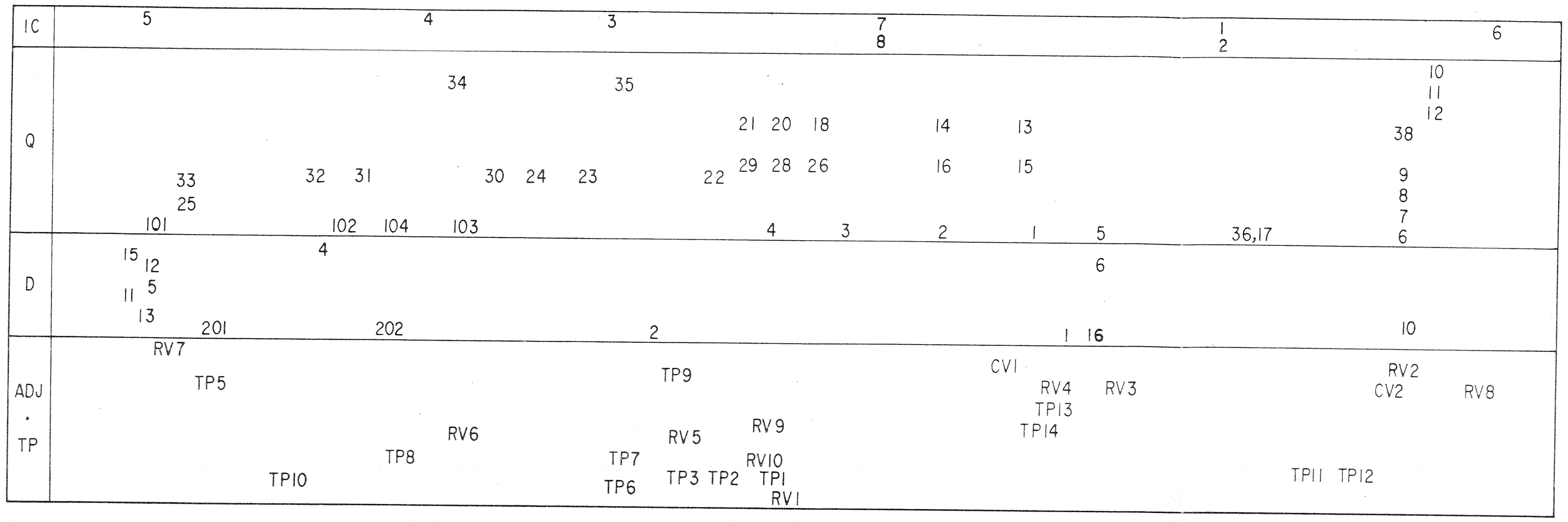
BD (PAL DECODER Y.TRAP) or **BM** (PAL-M DECODER Y.TRAP)

BD Board (PAL DECODER Y.TRAP) (BVM-2015P ONLY)
BM Board (PAL-M DECODER Y.TRAP) (BVM-2015PM ONLY)

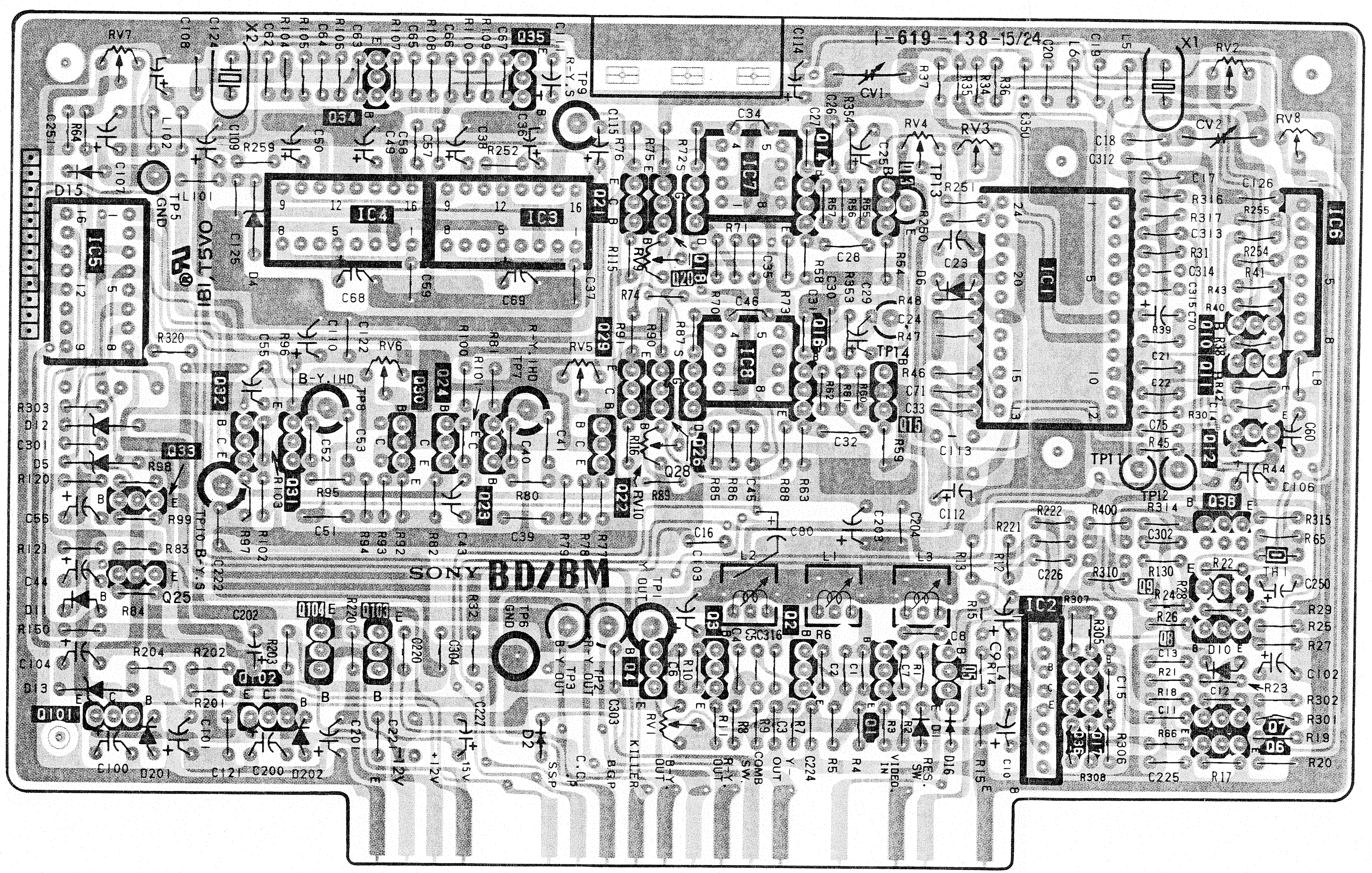


BA A18
BG B4
B1 A4
B1 B4
B2 A4
B2 B4
B3 A4
B3 B4
VIDEO IN 4AB
Y-TRAP
21 PULSE CORRECT
Y/C DELAY TIME
R-Y GAIN
B-Y GAIN
+12V
-12V
+12C
+12A
+12B
-12B
-12A
TP1 Y OUT
Y OUT 8AB
B-Y OUT 12
TP3 B-Y OUT
B-Y CLAMP LEVEL
B-Y IND. GAIN
B-Y IHD
B-Y.S TP10
R-Y.S TP9
R-Y IND.GAIN
R-Y CLAMP LEVEL
R-Y IHD TP7
PURE.C AB 6
RES SW 3B
C. CL. P 15B
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
R-Y OUTPUT
B-Y OUTPUT
VCC
BYPASS
COLOR CONTROL
CHROMA OUTPUT
UNICOLOR CONTROL
BURST OUTPUT
ACC FILTER
ACCAMP INPUT
3↓ PASS
BURST GATE INPUT
G-Y OUTPUT
B-Y INPUT
R-Y INPUT
ALT.PULSE INPUT
OSC.BIAS OUTPUT
OSC INPUT
OSC OUTPUT
APC FILTER
BURST INPUT
GND
APC BALANCE
4.4MHz BAND PASS ADJ
PHASE
PAL-D PHASE
14 A ALT PULSE
13 B KILLER
14 B B.G.P
3 A PHASE CONTROL
11 A PAL S/D
20 A +12V
19 A +5V
16 B SSP
19 B -5V
21 A -12V
-15V
BJ A14
D-1
B1 A14
B2 A14
B3 A14
BA A17
BG A3
BJ A7
B1 B13
B2 B13
B3 B13
BJ A12
B1 B14
B2 B14
B3 B14
HB-4
B1 A13
B2 A13
B3 A13
HB-2
B1 A11
B2 A11
B3 A11
BG B13
HB-2
B1 B16
B2 B16
B3 B16
TP6 TP5
GND
E 1
E 22
R-Y OUT 10
COMB.SW B9
TP2 R-Y OUT
B1 B9
B2 B9
B3 B9
BD (PAL DECODER Y . TRAP) or BM (PAL - M DECODER Y . TRAP)

BD board (PAL DECODER Y.TRAP) (BVM-2015P ONLY)
BM board (PAL-M DECODER Y.TRAP) (BVM-2015PM ONLY)



IC	5 4 3 7 8 1 2 6
Q	33 25 101 32 31 102 104 103 34 30 24 23 35 22 21 29 4 20 28 18 26 3 14 16 2 13 15 1 5 36,17 38 10 11 12 9 8 7 6
D	15 12 11 5 13 201 4 202 2 1 16 6 10
ADJ · TP	RV7 TP5 TP10 TP8 RV6 TP7 TP6 TP9 RV5 TP3 TP2 RV9 RV10 TP1 RV1 CV1 RV4 TP13 TP14 RV3 TP11 TP12 RV2 CV2 RV8


1-619-138-15/24
SONY
BD/BM
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
X1
X2
RV1
RV2
RV3
RV4
RV5
RV6
RV7
RV8
RV9
RV10
CV1
CV2
TP1
TP2
TP3
TP5
TP6
TP7
TP8
TP9
TP10
TP11
TP12
TP13
TP14
L1
L2
L3
GND
B-Y IHD
R-Y IHD
B-Y OUT
R-Y OUT
VIDEO IN
KILLER
COMB SW
12V
-12V
15V
SSP

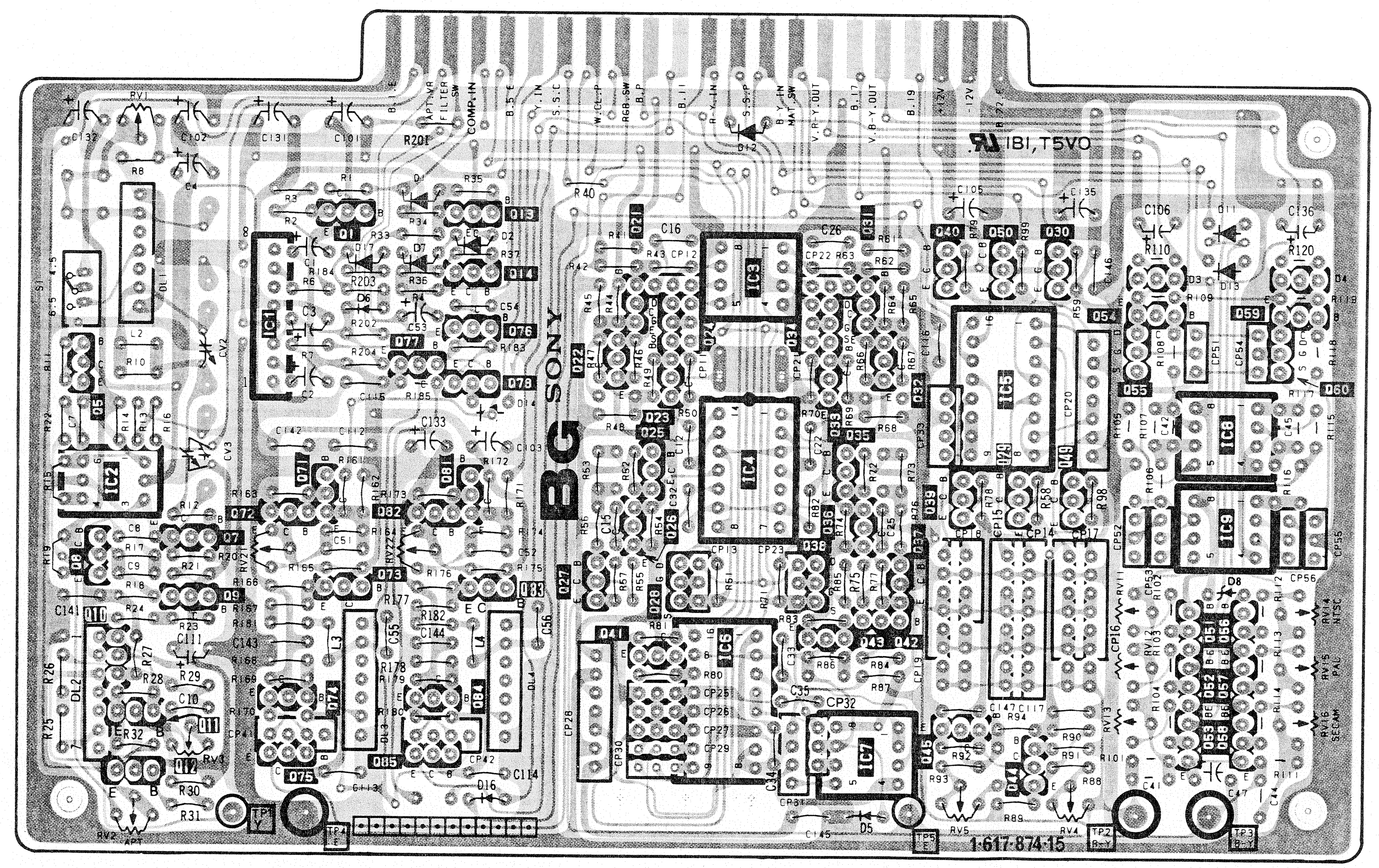
BD/BM BOARD

IC1	TA7193P	PAL DEMODULATOR
2	LA7016	RESIDUAL SWITCH
3	TL8608P	1H DELAY LINE
4	TL8608P	1H DELAY LINE
5	MC14053BCP	ANALOG SWITCHER
6	LA7016	BURST GATE
7	RC4558DQ	R-Y CLAMP
8	RC4558DQ	B-Y CLAMP
Q1	2SC403SP	BUFFER
2	2SC403SP	ACTIVE FILTER
3	2SC403SP	Y-DELAY CORRECTER
4	2SC3068	BUFFER
5	2SC3068	BUFFER
6	2SA844	PHASE CONTROLLER
7	2SC403SP	PHASE CONTROLLER
8	2SA844	PHASE CONT. AMP.
9	2SC403SP	PHASE CONT. AMP.
10	※	APL FILTER
11	※	APL FILTER
12	2SC403SP	APL FILTER SWITCH
13	2SC403SP	R-Y L.P.F
14	2SC403SP	R-Y L.P.F
15	2SC403SP	B-Y L.P.F
16	2SC403SP	B-Y L.P.F
17	2SC403SP	AMPLIFIER
18	2SK381	R-Y CLAMP
20	※	BUFFER
21	2SC403SP	BUFFER
22	2SC403SP	CCD OUT L.P.F
23	2SA844	CCD OUT L.P.F
24	2SC403SP	BUFFER
25	2SC3068	BUFFER
26	2SK381	B-Y CLAMP
28	※	BUFFER
29	2SC403SP	BUFFER
30	2SC403SP	CCD OUT L.P.F
31	2SA844	CCD OUT L.P.F
32	2SC403SP	BUFFER
33	2SC3068	BUFFER
34	2SC403SP	CCD CLOCK GEN
35	2SC403SP	CCD CLOCK GEN
36	2SC403SP	BUFFER
38	2SC403SP	BUFFER
101	2SB734	SYSTEM SWITCH
102	2SD774	SYSTEM SWITCH
103	DTA124ES	COMB. SWITCH
104	DTA124ES	COMB. SWITCH
D1	1SS119	SYSTEM SWITCH
2	1SS119	COMB. SWITCH
4	RD3.0 ES-B2	CCD BIAS
5	RD9.1 ES-B2	SWITCH BIAS
6	1SS119	KILLER SWITCH
10	1T25	PHASE CONTROL
11	1SS119	PAL S/D SWITCH
12	RD12 ES-B2	PHASE SWITCH
13	RD12 ES-B2	SYSTEM SWITCH
16	1SS119	COMB SW
201	1SS119	PROTECTOR
202	1SS119	PROTECTOR

- ● ▨ : Conductor side pattern
- ● ▧ : Component side pattern

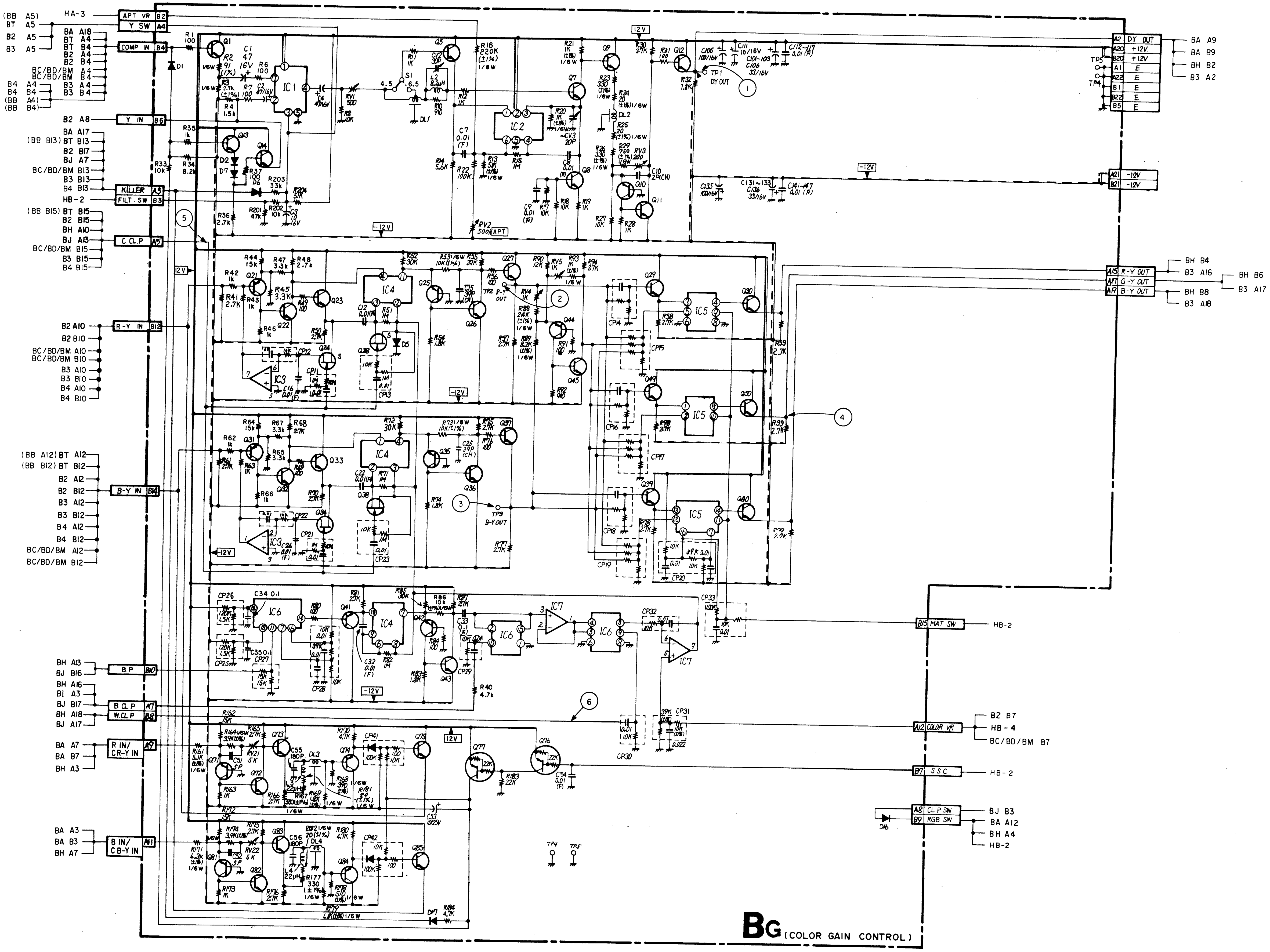
BG board (COLOR GAIN CONTROL, COMPONENT R-Y AMP & DELAY, APERTURE CONTROL,
Y DELAY, VECTOR OUT, NTSC MATRIX SW, G-Y MATRIX AMP)

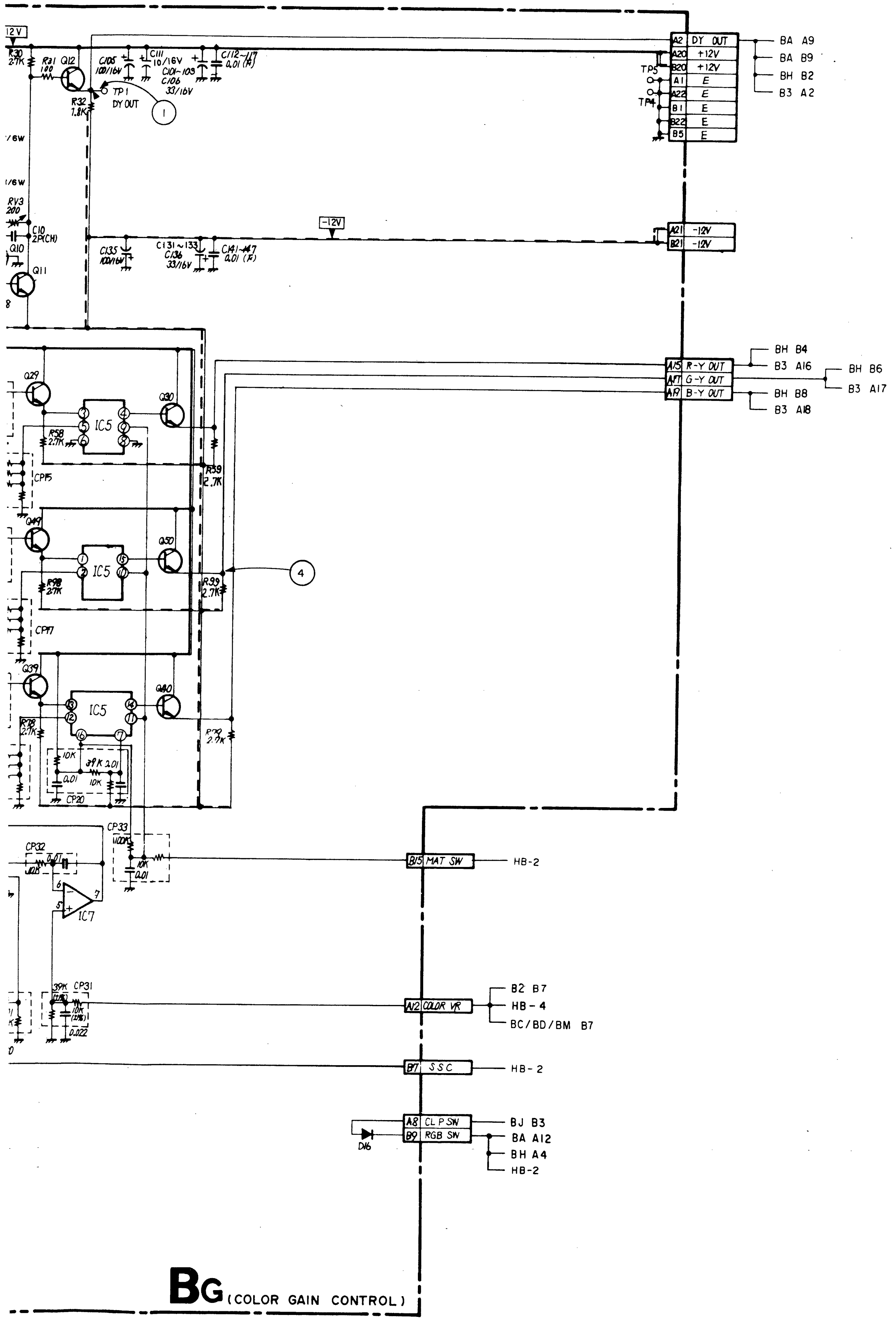
IC	2, 1, 6, 3, 4, 7, 5
Q	5, 8, 10, 11, 12, 7, 9, 72, 74, 75, 71, 73, 1, 77, 82, 84, 85, 13, 14, 76, 81, 83, 22, 27, 21, 26, 25, 23, 24, 28, 41, 34, 33, 38, 43, 31, 35, 36, 32, 42, 37, 40, 39, 45, 50, 29, 30, 44, 49
D	17, 6, 1, 7, 2, 16, 12, 5
TP ADJ	RV1, RV2, CV2, CV3, RV3, TP1, RV21, TP4, RV22, TP5, RV5, RV4, TP2, TP3


BG
SONY
IBI, T5VO
1-617-874-15
COMP-IN
V.R-Y.OUT
V.B-Y.OUT
+12V
-12V
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
IC9
RV1
RV2
RV3
RV4
RV5
TP1
TP2
TP3
TP4
TP5
CV2
CV3

● ▨ : Conductor side pattern
● ▨ : Component side pattern

BG board (COLOR GAIN CONTROL, COMPONENT R-Y AMP & DELAY, APERTURE CONTROL, Y DELAY, NTSC MATRIX SW, G-Y MATRIX AMP)

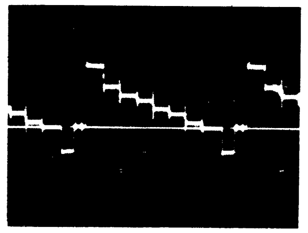

APT VR B2
Y SW A4
COMP IN B4
Y IN B6
KILLER A3
FILT. SW B3
C CLP A5
R-Y IN B12
B-Y IN B14
B P B10
B CLP A7
W CLP B8
R IN/ CR-Y IN A9
B IN/ CB-Y IN A11
DY OUT
+12V
-12V
R-Y OUT
G-Y OUT
B-Y OUT
MAT SW
COLOR VR
SSC
CL P SW
RGB SW
IC1
IC2
IC3
IC4
IC5
IC6
IC7
TP1 DY OUT
TP2 R-Y OUT
TP3 B-Y OUT
TP4
TP5
HA-3
HB-2
HB-4
BA A9
BA B9
BH B2
B3 A2
BH B4
B3 A16
BH B6
B3 A17
BH B8
B3 A18
B2 B7
BC/BD/BM B7
BJ B3
BA A12
BH A4
BG (COLOR GAIN CONTROL)

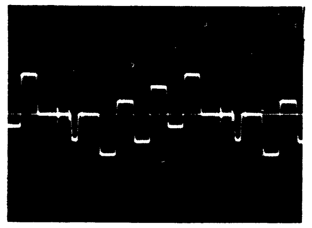

12V
R30 2.7K
R31 100
Q12
C105 100/16V
C111 10/16V
C101~103 C106 33/16V
C112~117 0.01 (F)
TP1 DY OUT
R32 1.8K
①
RV3 200
C10 2P(CH)
Q10
Q11
-12V
C131~133 C106 33/16V
C135 100/16V
C141~147 0.01 (F)
A2 DY OUT
A20 +12V
B20 +12V
A1 E
A22 E
B1 E
B22 E
B5 E
TP5
TP4
BA A9
BA B9
BH B2
B3 A2
A21 -12V
B21 -12V
Q29
Q30
IC5
R58 2.7K
R59 2.7K
CP15
Q49
Q50
R98 2.7K
R99 2.7K
CP17
④
Q39
Q40
R78 2.7K
R79 2.7K
10K
39K 0.01
0.01
CP20
A15 R-Y OUT
A17 G-Y OUT
A19 B-Y OUT
BH B4
B3 A16
BH B6
B3 A17
BH B8
B3 A18
CP32
CP33
IC7
B15 MAT SW
HB-2
39K CP31
0.022
A12 COLOR VR
B2 B7
HB-4
BC/BD/BM B7
B7 SSC
HB-2
A8 CLP SW
B9 RGB SW
D16
BJ B3
BA A12
BH A4
HB-2
BG (COLOR GAIN CONTROL)

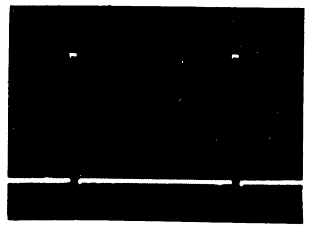
BG BOARD

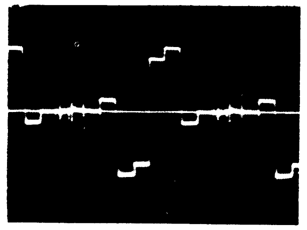
IC1	LA7016	FILTER SW
2	TX-429M	APERTURE
3	RC4558DQ	COLOR DIFFERENCE CLAMP
4	CX-718D	CHROMA CONTROL
5	MC14053BCP	MATRIX SW
6	MC14053BCP	CHROMA CONTROL
7	TL082CP	CHROMA CONTROL
8	TL082CP	VECTOR OUTPUT
9	TL082CP	VECTOR OUTPUT
Q1	2SC403SP	BUFF
5	2SC403SP	APERTURE
7	2SC403SP	APERTURE
8	2SC403SP	APERTURE
9	2SC403SP	Y DELAY
10	2SA844	Y AMP
11	2SC403SP	Y AMP
12	2SC403SP	Y AMP
13	2SC403SP	BUFF
14	2SC3068	BUFF
21	2SA844	R-Y AMP
22	2SC403SP	R-Y AMP
23	2SC403SP	R-Y CLAMP
24	2SK381	R-Y CLAMP
25	2SA844	R-Y CHROMA CONTROL
26	2SC403SP	R-Y CHROMA CONTROL
27	2SC403SP	R-Y CHROMA CONTROL
28	2SK381	R-Y CHROMA CONTROL
29	2SC403SP	R-Y BUFF
30	2SC403SP	R-Y BUFF
31	2SA844	B-Y AMP
32	2SC403SP	B-Y AMP
33	2SC403SP	B-Y CLAMP
34	2SK381	B-Y CLAMP
35	2SA844	B-Y CHROMA CONTROL
36	2SC403SP	B-Y CHROMA CONTROL
37	2SC403SP	B-Y CHROMA CONTROL
38	2SK381	B-Y CHROMA CONTROL
39	2SC403SP	B-Y BUFF
40	2SC403SP	B-Y BUFF
41	2SA844	CHROMA CONTROL
42	2SA844	CHROMA CONTROL
43	2SC403SP	CHROMA CONTROL

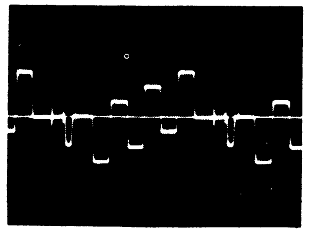
Q44	2SA844	CHROMA CONTROL
45	2SC403SP	CHROMA CONTROL
49	2SC403SP	G-Y BUFF
50	2SC403SP	G-Y BUFF
51	DTA124ES	GAIN CHANGE SW
52	DTA124ES	GAIN CHANGE SW
53	DTA124ES	GAIN CHANGE SW
54	2SC403SP	R-Y BUFF
55	2SK381	R-Y CLAMP
56	DTA124ES	GAIN CHANGE SW
57	DTA124ES	GAIN CHANGE SW
58	DTA124ES	GAIN CHANGE SW
59	2SC403SP	B-Y BUFF
60	2SK381	B-Y CLAMP
71	2SA844	R-Y AMP
72	2SC403SP	R-Y AMP
73	2SC403SP	R-Y AMP
74	2SA844	R-Y DELAY
75	2SC3068	R-Y BUFF
76	DTA124ES	COMPONENT SW
77	DTA124ES	COMPONENT SW
78	DTC144ES	COMPONENT SW
81	2SA844	B-Y AMP
82	2SC403SP	B-Y AMP
83	2SC403SP	B-Y AMP
84	2SA844	B-Y DELAY
85	2SC3068	B-Y BUFF
D1	1SS119	COMPONENT SW
2	1SS119	DC SHIFT SW
3	MC932	PROTECT
4	MC932	PROTECT
5	1SS119	PROTECT
6	RD6.2EB2	DC SHIFT
7	1SS119	FILTER SW
8	RD6.2E-B	+6V REG
11	1SS119	GAIN CHANGE SW
12	1SS119	GAIN CHANGE SW
13	1SS119	GAIN CHANGE SW
14	1SS119	GAIN CHANGE SW
16	1SS119	R.G.B. SW
17	1SS119	KILLER

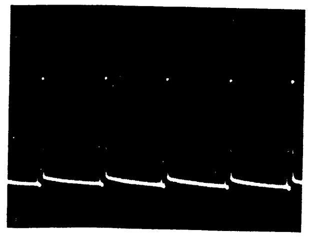

① 1.0Vp-p (H)


③ 1.7Vp-p (H)


⑤ 4.8Vp-p (H)


② 1.4Vp-p (H)

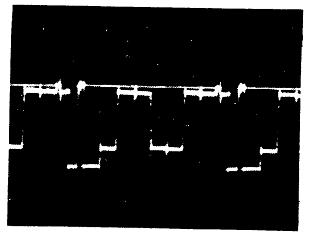

④ 0.9Vp-p (H)


⑥ 12Vp-p (H)

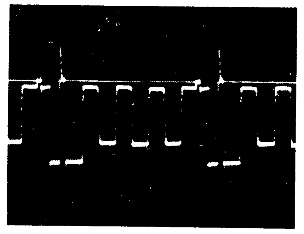
BH BOARD

IC1(1/3)	TC4053BP	COMPOSITE/R.G.B. CHANGE SW
(2/3)		SET UP & CROSS HATCH SW
(3/3)		SCREENING SW
2(1/3)	TC4053BP	COMPOSITE/R.G.B. CHANGE SW
(2/3)		SET UP SW
(3/3)		SCREENING SW
3(1/3)	TC4053BP	COMPOSITE/R.G.B. CHANGE SW
(2/3)		SET UP SW
(3/3)		SCREENING SW
4(1/3)	TC4053BP	COMPOSITE/R.G.B. CHANGE SW
(2/3)		SET UP SW
(3/3)		SCREENING SW
5	RC4558S	SAMPLE HOLD
6	RC4558S	SAMPLE HOLD
7	LA7016	BLUE ONLY SW
8	LA7016	BLUE ONLY SW
9	MC14053BCP	AGC PULSE, SET UP, WHITE, VITC INSERT GEN
10(1/2)	MC14053BCP	AGC PULSE, SET UP, WHITE, VITC INSERT GEN
(2/2)		COLOR DIFFERENCE & R.G.B. SCREENING PULSE GEN
11(1/4)	MC14081BCP	AGC PULSE, SET UP, WHITE, VITC INSERT GEN
(3/4)		
(2/4)		COLOR DIFFERENCE & R.G.B. SCREENING PULSE GEN
(4/4)		Y SCREENING PULSE GEN
12	MC14081BCP	AGC PULSE, SET UP, WHITE, VITC INSERT GEN
13	MC14001BCP	AGC PULSE, SET UP, WHITE, VITC INSERT GEN
14	TC4030BP	AGC PULSE, SET UP, WHITE, VITC INSERT GEN
101	TX-429M	R CONTRAST CONTROL
102	TL082CP	R CONTRAST & BRIGHT CONTROL
201	TX-429M	G CONTRAST CONTROL
202	TL082CP	G CONTRAST & BRIGHT CONTROL
301	TX-429M	B CONTRAST CONTROL
302	TL082CP	B CONTRAST & BRIGHT CONTROL
Q1	2SC403SP	Y BUFF
2	2SK523	Y SAMPLE HOLD
3	2SA844	Y BUFF
4	2SC403SP	R-Y/R BUFF

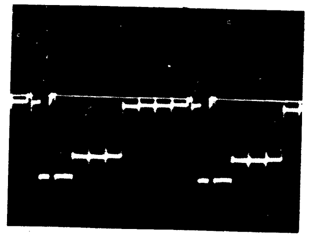
Q5	2SK523	R-Y/Y SAMPLE HOLD
6	2SA844	R-Y/R BUFF
7	2SC403SP	G-Y/R BUFF
8	2SK523	G-Y/Y SAMPLE HOLD
9	2SA844	G-Y/G BUFF
10	2SC403SP	B-Y/B BUFF
11	2SK523	B-Y/B SAMPLE HOLD
12	2SA844	B-Y/B BUFF
13	2SA844	R BUFF
14	2SA844	G BUFF
15	2SA844	B BUFF
16	2SC3068	AGC PULSE BUFF
101	2SK381	R CONTRAST CONTROL
102	2SA844	R AMP
103	2SC403SP	R AMP
104	2SC403SP	R LIMITER
105	2SC403SP	R LIMITER
106	2SK381	R BRIGHT CONTROL
107	2SK381	R CONTRAST CONTROL
108	2SK381	R CONTRAST CONTROL
201	2SK381	G CONTRAST CONTROL
202	2SA844	G AMP
203	2SC403SP	G AMP
204	2SC403SP	G LIMITER
205	2SC403SP	G LIMITER
206	2SK381	G BRIGHT CONTROL
207	2SK381	G CONTRAST CONTROL
208	2SK381	G CONTRAST CONTROL
301	2SK381	B CONTRAST CONTROL
302	2SA844	B AMP
303	2SC403SP	B AMP
304	2SC403SP	B LIMITER
305	2SC403SP	B LIMITER
306	2SK381	B BRIGHT CONTROL
307	2SK381	B CONTRAST CONTROL
308	2SK381	B CONTRAST CONTROL
D1	1SS119	
101	1SS119	R LIMITER
102	1SS119	R PROTECT
201	1SS119	G LIMITER
202	1SS119	G PROTECT
301	1SS119	B LIMITER
302	1SS119	B PROTECT



① 0.8Vp-p (H)

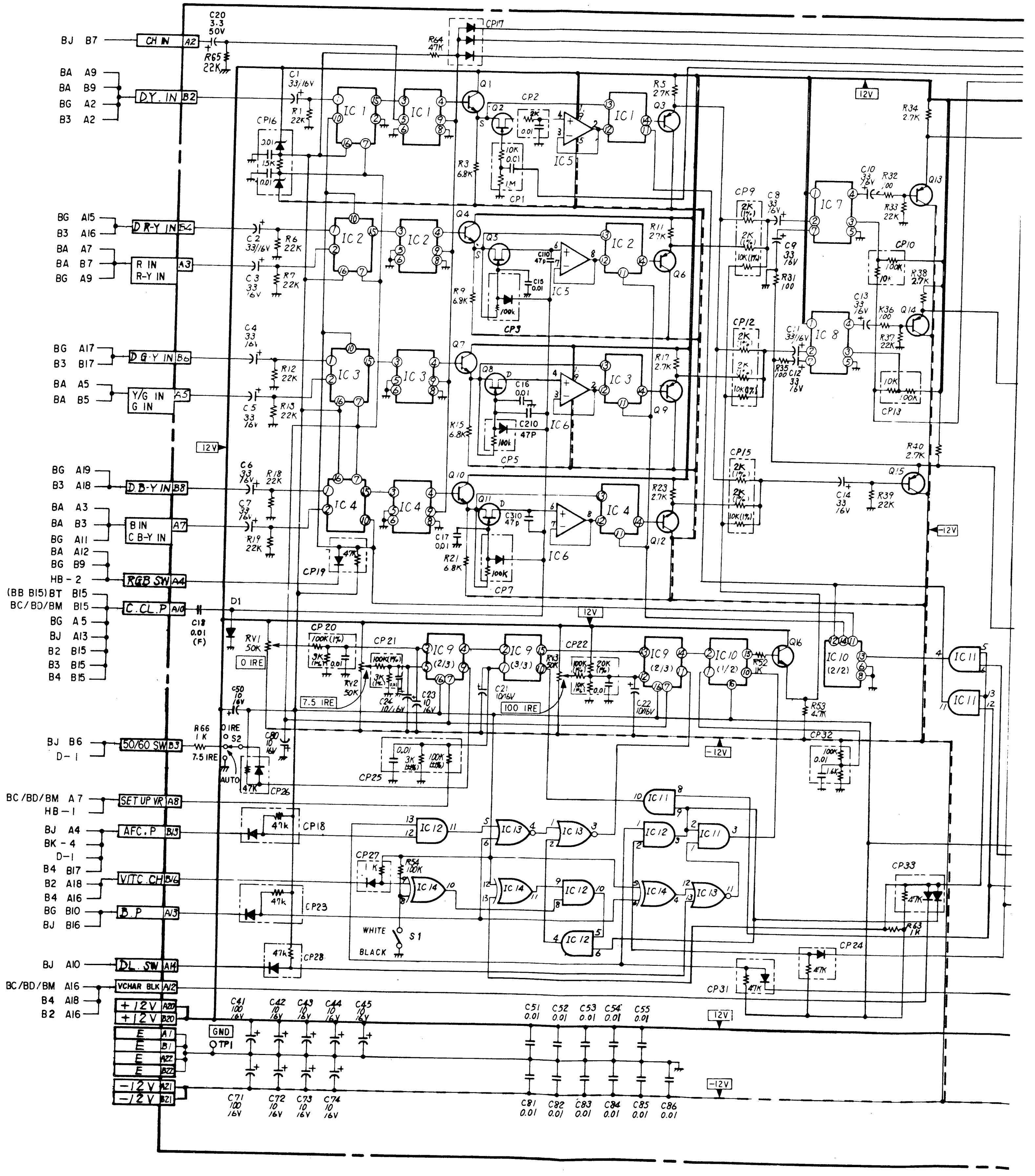


③ 0.7Vp-p (H)



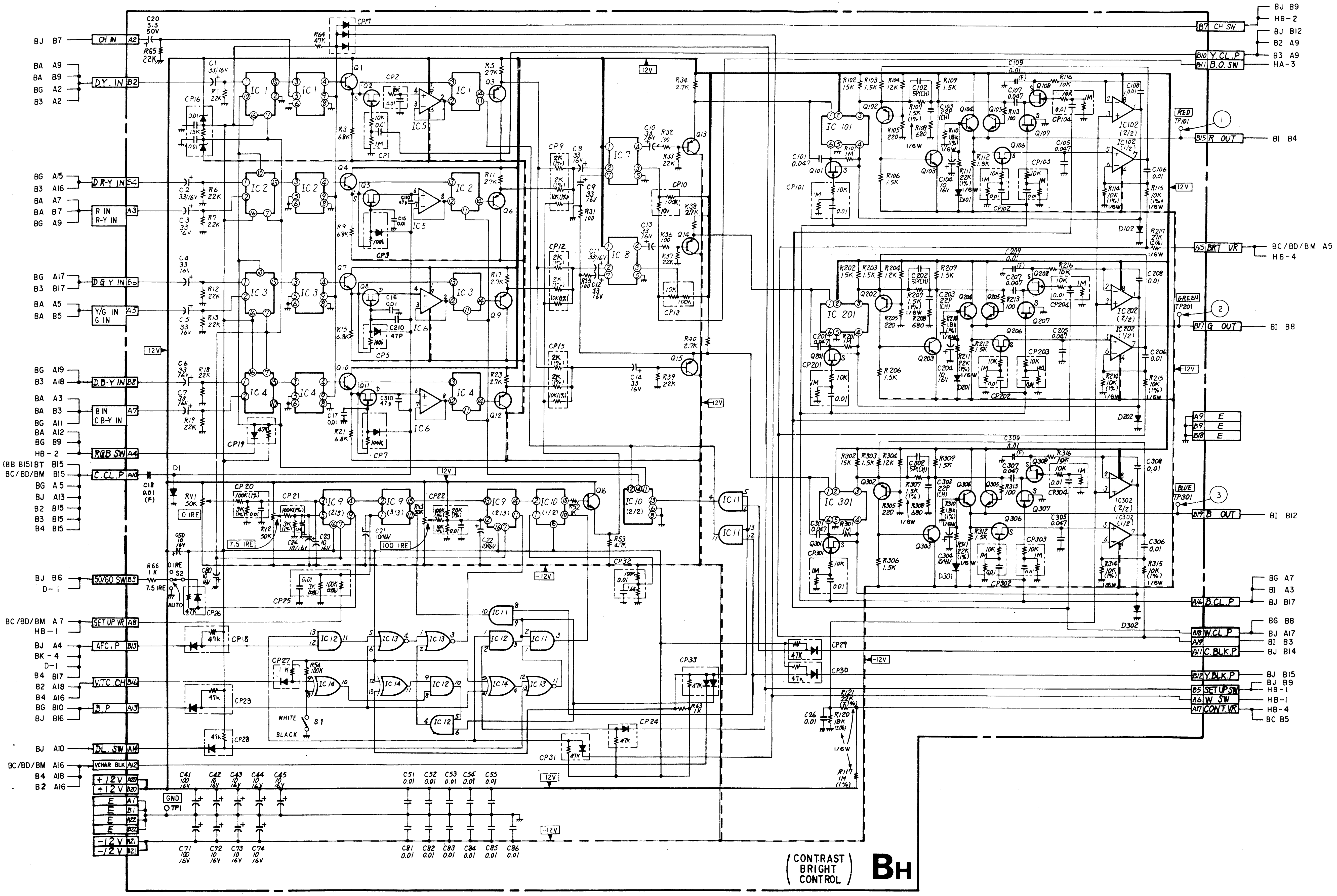
② 0.8Vp-p (H)

BH board (Y/COLOR DIFFERENCE/RGB SIGNAL SWITCHING, Y-C MATRIX, CONTRAST/BRIGHTNESS CONTROL)



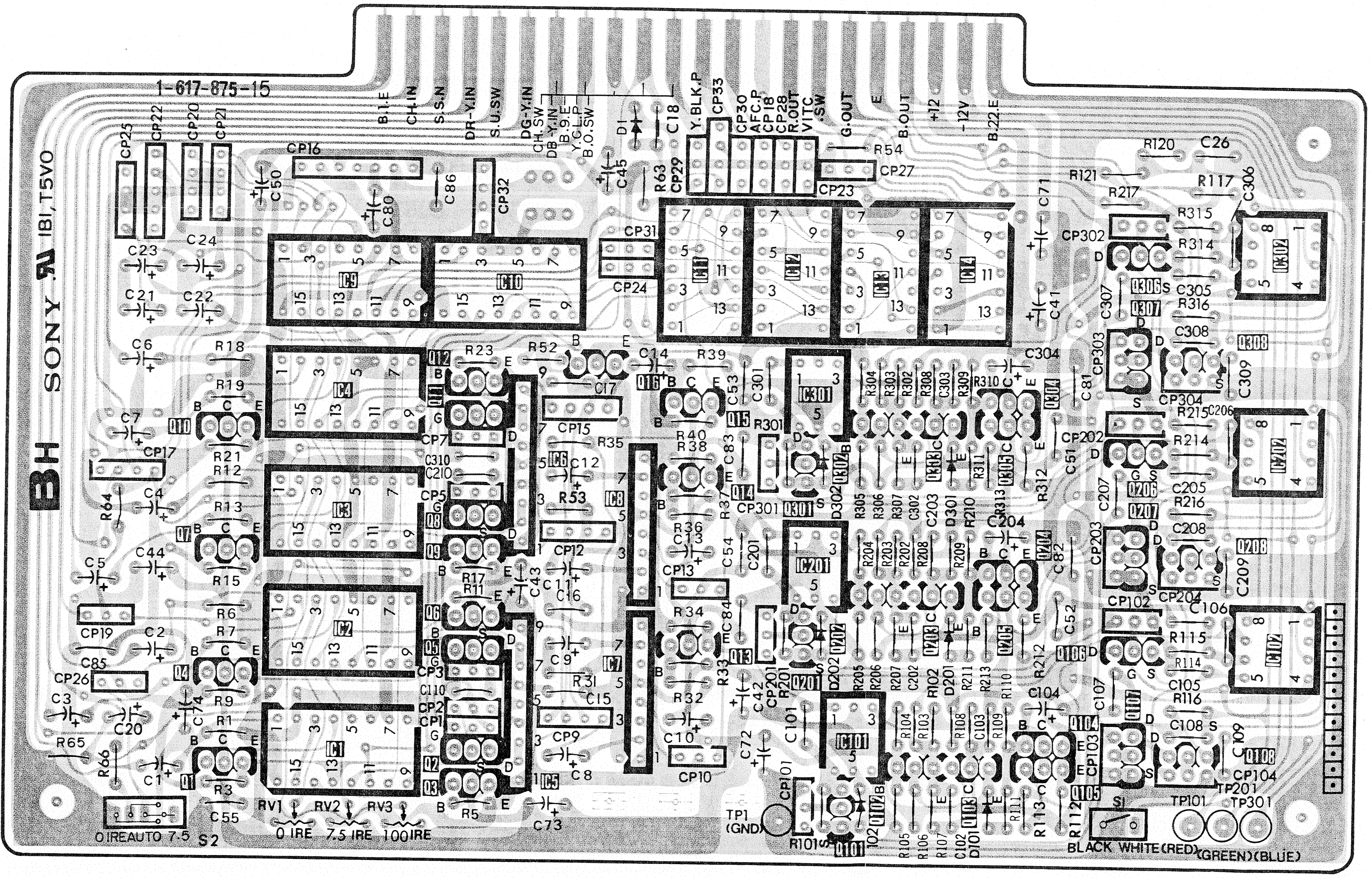
BJ B7
CH IN A2
C20 3.3 50V
R65 22K
BA A9
BA B9
BG A2
B3 A2
DY. IN B2
BG A15
B3 A16
D R-Y IN B4
BA A7
BA B7
BG A9
R IN R-Y IN A3
BG A17
B3 B17
D G-Y IN B6
BA A5
BA B5
Y/G IN G IN A5
12V
BG A19
B3 A18
D B-Y IN B8
BA A3
BA B3
BG A11
B IN C B-Y IN A7
BA A12
BG B9
HB-2
RGB SW A4
(BB B15) BT B15
BC/BD/BM B15
BG A5
BJ A13
B2 B15
B3 B15
B4 B15
C.CL.P A10
C18 0.01 (F)
D1
BJ B6
D-1
50/60 SW B3
R66 1K
7.5 IRE
0 IRE
S2
AUTO
BC/BD/BM A7
HB-1
SET UP VR A8
BJ A4
BK-4
D-1
B4 B17
AFC.P B13
B2 A18
B4 A16
VITC CH B16
BG B10
BJ B16
B.P A13
BJ A10
DL. SW A14
BC/BD/BM A16
B4 A18
B2 A16
VCHAR BLK A12
+12V A20
+12V B20
E A1
E B1
E A22
E B22
-12V A21
-12V B21
GND
TP1
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
IC9
IC10
IC11
IC12
IC13
IC14
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
Q11
Q12
Q13
Q14
Q15
Q16
CP1
CP2
CP3
CP5
CP7
CP9
CP10
CP12
CP13
CP15
CP16
CP17
CP18
CP19
CP20
CP21
CP22
CP23
CP24
CP25
CP26
CP27
CP28
CP31
CP32
CP33
RV1 50K
RV2 50K
0 IRE
7.5 IRE
100 IRE
WHITE
BLACK
S1
-12V
C41 100 16V
C42 10 16V
C43 10 16V
C44 10 16V
C45 10 16V
C51 0.01
C52 0.01
C53 0.01
C54 0.01
C55 0.01
C71 100 16V
C72 10 16V
C73 10 16V
C74 10 16V
C81 0.01
C82 0.01
C83 0.01
C84 0.01
C85 0.01
C86 0.01

BH board (Y/COLOR DIFFERENCE/RGB SIGNAL SWITCHING, Y-C MATRIX, CONTRAST/BRIGHTNESS CONTROL)


BJ B7
CH IN A2
BA A9
BA B9
BG A2
B3 A2
DY. IN B2
BG A15
B3 A16
DR-Y IN B4
BA A7
BA B7
BG A9
R IN
R-Y IN A3
BG A17
B3 B17
DG-Y IN B6
BA A5
BA B5
Y/G IN
G IN A5
BG A19
B3 A18
DB-Y IN B8
BA A3
BA B3
BG A11
BA A12
BG B9
B IN
CB-Y IN A7
HB-2
RGB SW A4
(BB B15) BT B15
BC/BD/BM B15
C.CL.P A10
BG A5
BJ A13
B2 B15
B3 B15
B4 B15
BJ B6
D-1
50/60 SW B3
BC/BD/BM A7
HB-1
SET UP VR A8
BJ A4
BK-4
D-1
B4 B17
AFC.P B13
B2 A18
B4 A16
VITC CH B16
BG B10
BJ B16
B.P A13
BJ A10
DL SW A11
BC/BD/BM A16
B4 A18
B2 A16
VCHAR BLK A12
+12V A20
+12V B20
E A1
E B1
E A22
E B22
-12V A21
-12V B21
GND
TP1
0 IRE
7.5 IRE
100 IRE
AUTO
WHITE
BLACK
S1
S2
RV1 50K
RV2 50K
12V
-12V
IC 1
IC 2
IC 3
IC 4
IC 5
IC 6
IC 7
IC 8
IC 9
IC 10
IC 11
IC 12
IC 13
IC 14
IC 101
IC 102
IC 201
IC 202
IC 301
IC 302
BJ B9
HB-2
BJ B12
B2 A9
B3 A9
HA-3
B7 CH SW
B10 Y.CL.P
B11 B.O.SW
RED
TP101
①
B15 R OUT
BI B4
A15 BRT VR
BC/BD/BM A5
HB-4
GREEN
TP201
②
B17 G OUT
BI B8
A9 E
B9 E
B18 E
BLUE
TP301
③
B19 B OUT
BI B12
BG A7
BI A3
A16 B.CL.P
BJ B17
BG B8
A18 W.CL.P
BJ A17
A19
BI B3
A11 C.BLK.P
BJ B14
B12 Y.BLK.P
BJ B15
B5 SET UP SW
BJ B9
HB-1
A6 W SW
HB-1
A17 CONT.VR
HB-4
BC B5
CONTRAST
BRIGHT
CONTROL
BH

BH board (Y/COLOR DIFFERENCE/RGB SIGNAL SWITCHING, Y-C MATRIX, CONTRAST/BRIGHTNESS CONTROL)

IC	9 4 3 2 1 10 6 5 8 7 11 12 301 201 101 13 14 202
Q	10 7 4 1 12 11 8 9 6 5 2 3 16 15 14 13 301 201 101 302 202 102 303 203 103 304 305 204 205 104 105 306 307 206 207 106 107 308 208 108
D	1 302 202 102 301 201 101
TP ADJ	RV1 RV2 RV3 TP1 TP201 TP101 TP301

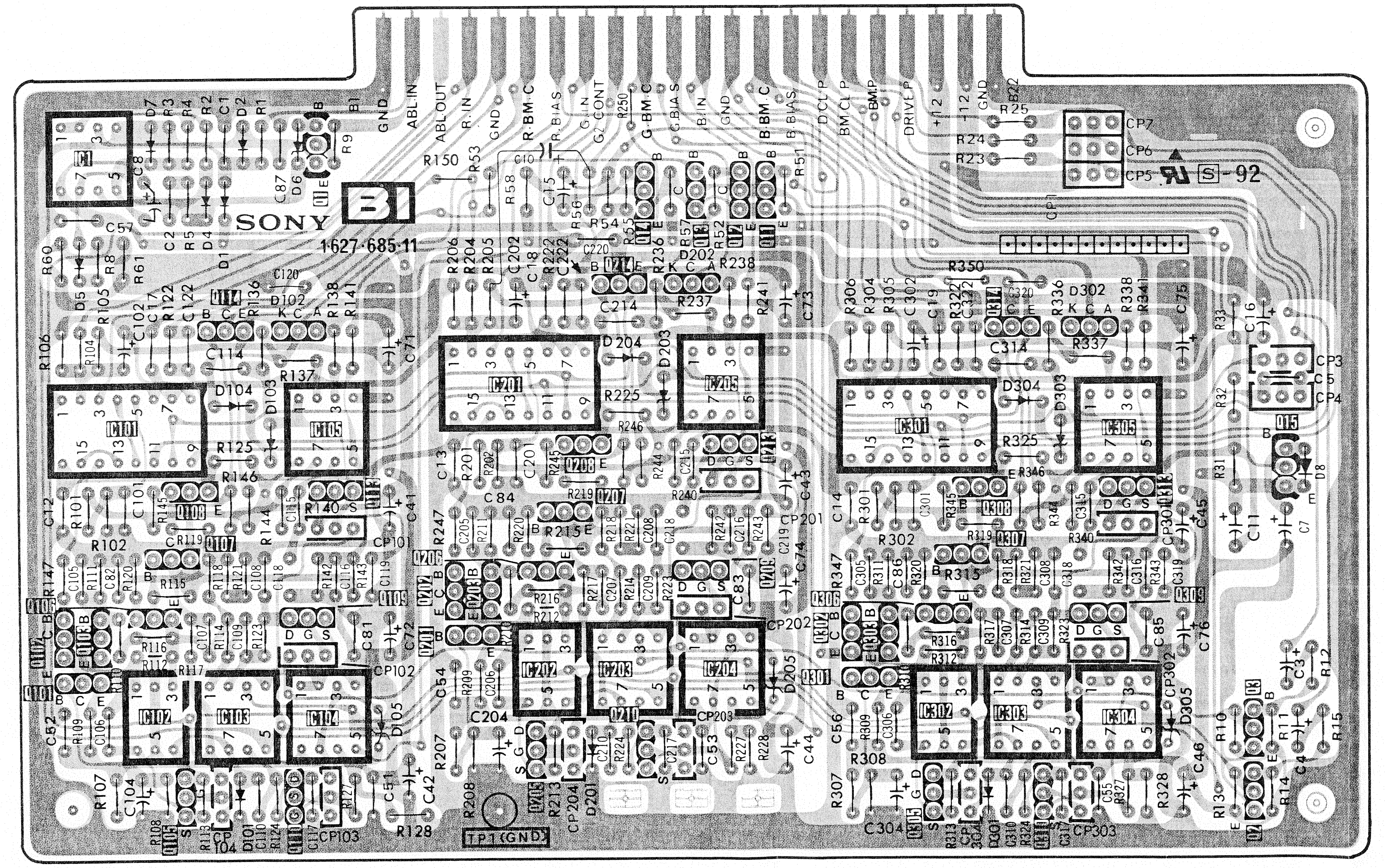

1-617-875-15
BH
SONY
IBI, T5V0
B.I.E
CH.IN
S.S.N
DR-Y.IN
S.U.SW
DG-Y.IN
CH.SW
DB-Y.IN
B.9.E
Y.G.L.P
B.O.SW
D1
C18
Y.BLK.P
CP33
CP30
AFC.P
CP18
CP28
R.OUT
VITC
.SW
G.OUT
E
B.OUT
+12
-12V
B.22.E
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
IC9
IC10
IC11
IC12
IC13
IC14
IC101
IC102
IC201
IC202
IC301
IC302
RV1
RV2
RV3
0 IRE
7.5 IRE
100IRE
0IRE
AUTO
7.5
S2
S1
BLACK
WHITE
TP1
(GND)
TP101
TP201
TP301
(RED)
(GREEN)
(BLUE)

● ▨ : Conductor side pattern

● ▨ : Component side pattern

BI board (DRIVE CONTROL, BEAM CURRENT CONTROL)

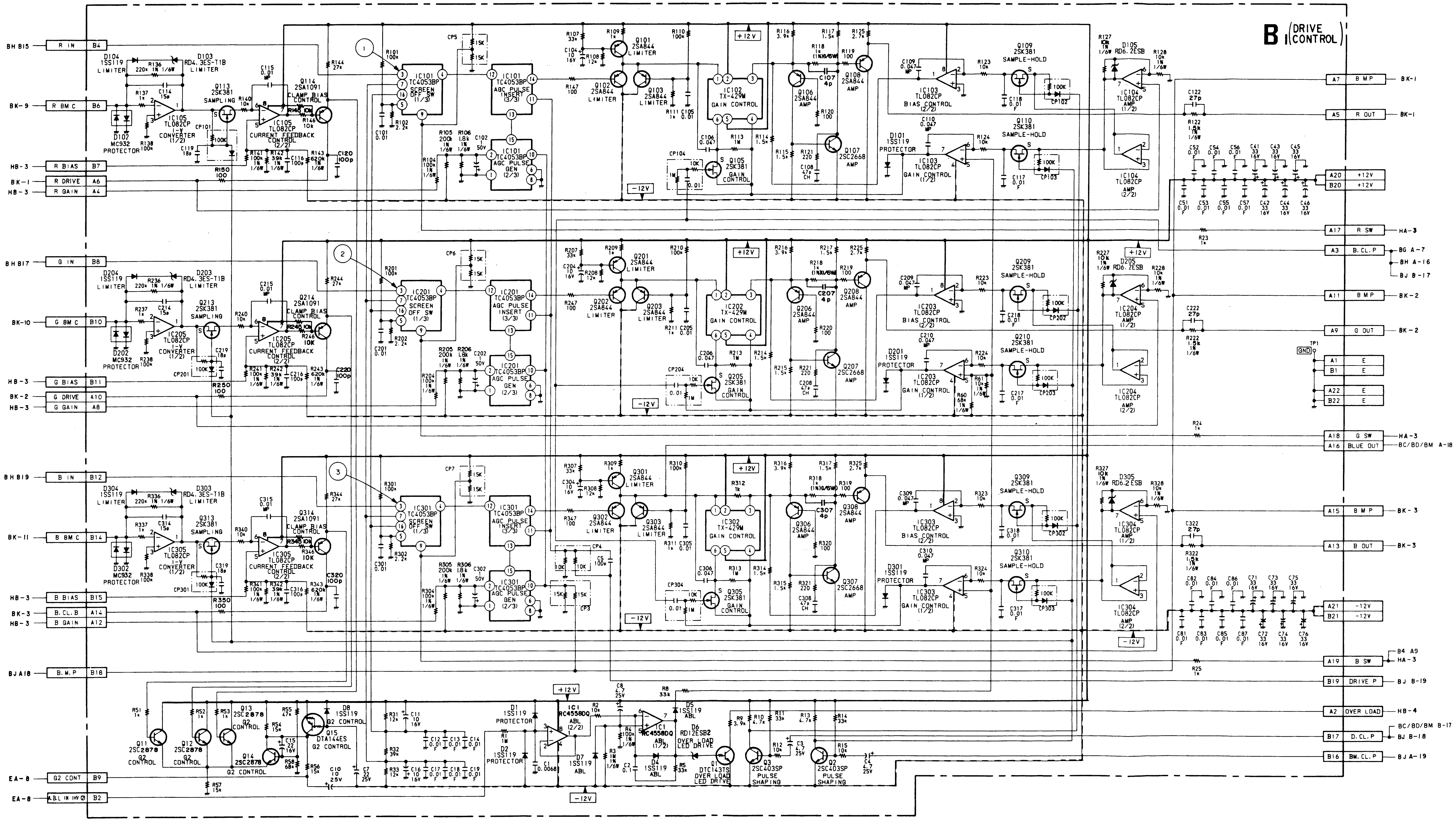
IC	1 101 102 103 105 104 201 202 203 205 204 301 302 303 305 304
Q	102 101 103 106 105 108 114 107 1 110 109 113 202 201 203 206 205 208 214 207 210 14 13 209 12 11 213 302 301 303 306 305 308 307 314 310 309 313 3 2 15
D	5 7 4 1 104 101 2 103 102 6 105 201 204 203 202 205 301 304 303 302 305 8
TP	1

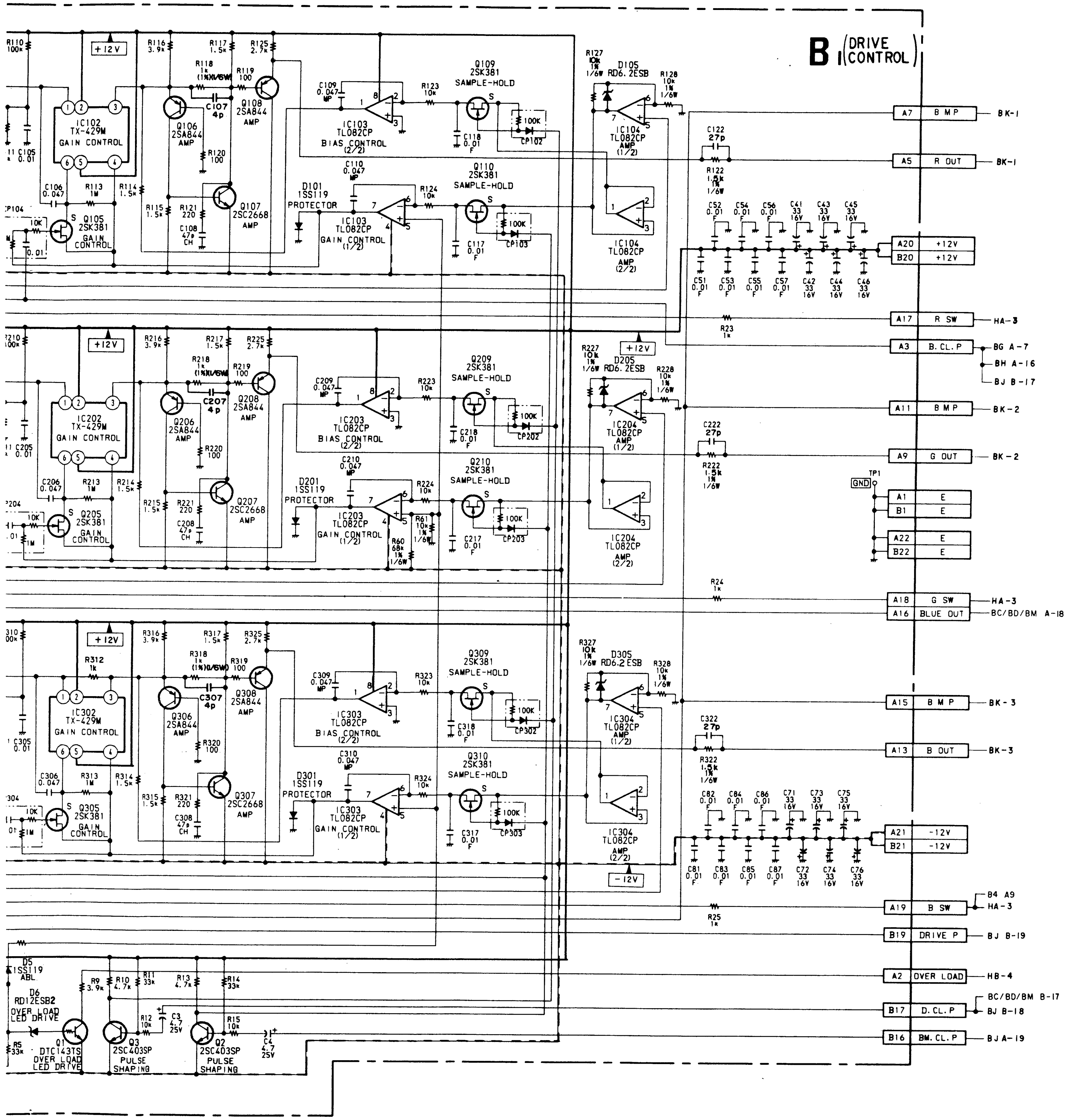

GND
ABL IN
ABL OUT
R IN
GND
R BM C
R BIAS
G IN
G CONT
G BM C
G BIAS
B IN
GND
B BM C
B BIAS
DCLP
BM CLP
BMP
DRIVE P
+12
-12
GND
SONY
BI
1-627-685-11
IC1
IC101
IC102
IC103
IC104
IC105
IC201
IC202
IC203
IC204
IC205
IC301
IC302
IC303
IC304
IC305
CP5
CP6
CP7
S-92
TP1 (GND)

● ▨ : Conductor side pattern

● ▨ : Component side pattern

BI board (DRIVE CONTROL, BEAM CURRENT CONTROL)

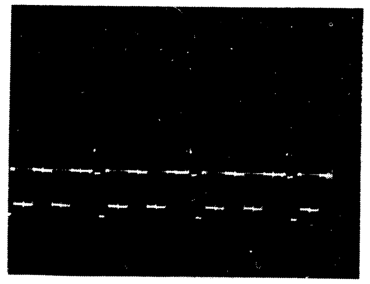

B I (DRIVE CONTROL)
BH B15 R IN B4
BK-9 R BM C B6
HB-3 R BIAS B7
BK-1 R DRIVE A6
HB-3 R GAIN A4
BH B17 G IN B8
BK-10 G BM C B10
HB-3 G BIAS B11
BK-2 G DRIVE A10
HB-3 G GAIN A8
BH B19 B IN B12
BK-11 B BM C B14
HB-3 B BIAS B15
BK-3 B.CL.B A14
HB-3 B GAIN A12
BJ A18 B.M.P B18
EA-8 G2 CONT B9
EA-8 ABL IN (HV) B2
A7 R MP BK-1
A5 R OUT BK-1
A20 +12V
B20 +12V
A17 R SW HA-3
A3 B.CL.P BG A-7 BH A-16 BJ B-17
A11 G MP BK-2
A9 G OUT BK-2
TP1 GND
A1 E
B1 E
A22 E
B22 E
A18 G SW HA-3
A16 BLUE OUT BC/BD/BM A-18
A15 B MP BK-3
A13 B OUT BK-3
A21 -12V
B21 -12V
A19 B SW B4 A9 HA-3
B19 DRIVE P BJ B-19
A2 OVER LOAD HB-4
B17 D.CL.P BC/BD/BM B-17 BJ B-18
B16 BM.CL.P BJ A-19
IC101 TC4053BP SCREEN OFF SW (1/3)
IC101 TC4053BP AGC PULSE INSERT (3/3)
IC101 TC4053BP AGC PULSE GEN (2/3)
IC102 TX-429M GAIN CONTROL
IC103 TL082CP BIAS CONTROL (2/2)
IC103 TL082CP GAIN CONTROL (1/2)
IC104 TL082CP AMP (1/2)
IC104 TL082CP AMP (2/2)
IC105 TL082CP I-V CONVERTER (1/2)
IC105 TL082CP CURRENT FEEDBACK CONTROL (2/2)
Q101 2SA844 LIMITER
Q102 2SA844 LIMITER
Q103 2SA844 LIMITER
Q105 2SK381 GAIN CONTROL
Q106 2SA844 AMP
Q107 2SC2668 AMP
Q108 2SA844 AMP
Q109 2SK381 SAMPLE-HOLD
Q110 2SK381 SAMPLE-HOLD
Q113 2SK381 SAMPLING
Q114 2SA1091 CLAMP BIAS CONTROL
D101 1SS119 PROTECTOR
D102 MC932 PROTECTOR
D103 RD4.3ES-T1B LIMITER
D104 1SS119 LIMITER
D105 RD6.2ESB
IC201 TC4053BP SCREEN OFF SW (1/3)
IC201 TC4053BP AGC PULSE INSERT (3/3)
IC201 TC4053BP AGC PULSE GEN (2/3)
IC202 TX-429M GAIN CONTROL
IC203 TL082CP BIAS CONTROL (2/2)
IC203 TL082CP GAIN CONTROL (1/2)
IC204 TL082CP AMP (1/2)
IC204 TL082CP AMP (2/2)
IC205 TL082CP I-V CONVERTER (1/2)
IC205 TL082CP CURRENT FEEDBACK CONTROL (2/2)
Q201 2SA844 LIMITER
Q202 2SA844 LIMITER
Q203 2SA844 LIMITER
Q205 2SK381 GAIN CONTROL
Q206 2SA844 AMP
Q207 2SC2668 AMP
Q208 2SA844 AMP
Q209 2SK381 SAMPLE-HOLD
Q210 2SK381 SAMPLE-HOLD
Q213 2SK381 SAMPLING
Q214 2SA1091 CLAMP BIAS CONTROL
D201 1SS119 PROTECTOR
D202 MC932 PROTECTOR
D203 RD4.3ES-T1B LIMITER
D204 1SS119 LIMITER
D205 RD6.2ESB
IC301 TC4053BP SCREEN OFF SW (1/3)
IC301 TC4053BP AGC PULSE INSERT (3/3)
IC301 TC4053BP AGC PULSE GEN (2/3)
IC302 TX-429M GAIN CONTROL
IC303 TL082CP BIAS CONTROL (2/2)
IC303 TL082CP GAIN CONTROL (1/2)
IC304 TL082CP AMP (1/2)
IC304 TL082CP AMP (2/2)
IC305 TL082CP I-V CONVERTER (1/2)
IC305 TL082CP CURRENT FEEDBACK CONTROL (2/2)
Q301 2SA844 LIMITER
Q302 2SA844 LIMITER
Q303 2SA844 LIMITER
Q305 2SK381 GAIN CONTROL
Q306 2SA844 AMP
Q307 2SC2668 AMP
Q308 2SA844 AMP
Q309 2SK381 SAMPLE-HOLD
Q310 2SK381 SAMPLE-HOLD
Q313 2SK381 SAMPLING
Q314 2SA1091 CLAMP BIAS CONTROL
D301 1SS119 PROTECTOR
D302 MC932 PROTECTOR
D303 RD4.3ES-T1B LIMITER
D304 1SS119 LIMITER
D305 RD6.2ESB
Q11 2SC2878 G2 CONTROL
Q12 2SC2878 G2 CONTROL
Q13 2SC2878 G2 CONTROL
Q14 2SC2878 G2 CONTROL
Q15 DTA144ES G2 CONTROL
D8 1SS119 G2 CONTROL
D1 1SS119 PROTECTOR
R1 1M PROTECTOR 1SS119
IC1 RC4558DQ ABL (2/2)
IC1 RC4558DQ ABL (1/2)
D7 1SS119 ABL
D4 1SS119 ABL
D5 1SS119 ABL
D6 RD12ESB2 OVER LOAD LED DRIVE
Q1 DTC143TS OVER LOAD LED DRIVE
Q3 2SC403SP PULSE SHAPING
Q2 2SC403SP PULSE SHAPING
+12V
-12V
CP1
CP2
CP3
CP4
CP5
CP6
CP7
①
②
③


B (DRIVE CONTROL)
IC102 TX-429M GAIN CONTROL
IC202 TX-429M GAIN CONTROL
IC302 TX-429M GAIN CONTROL
IC103 TL082CP BIAS CONTROL (2/2)
IC103 TL082CP GAIN CONTROL (1/2)
IC203 TL082CP BIAS CONTROL (2/2)
IC203 TL082CP GAIN CONTROL (1/2)
IC303 TL082CP BIAS CONTROL (2/2)
IC303 TL082CP GAIN CONTROL (1/2)
IC104 TL082CP AMP (1/2)
IC104 TL082CP AMP (2/2)
IC204 TL082CP AMP (1/2)
IC204 TL082CP AMP (2/2)
IC304 TL082CP AMP (1/2)
IC304 TL082CP AMP (2/2)
Q105 2SK381 GAIN CONTROL
Q106 2SA844 AMP
Q107 2SC2668 AMP
Q108 2SA844 AMP
Q109 2SK381 SAMPLE-HOLD
Q110 2SK381 SAMPLE-HOLD
Q205 2SK381 GAIN CONTROL
Q206 2SA844 AMP
Q207 2SC2668 AMP
Q208 2SA844 AMP
Q209 2SK381 SAMPLE-HOLD
Q210 2SK381 SAMPLE-HOLD
Q305 2SK381 GAIN CONTROL
Q306 2SA844 AMP
Q307 2SC2668 AMP
Q308 2SA844 AMP
Q309 2SK381 SAMPLE-HOLD
Q310 2SK381 SAMPLE-HOLD
D101 1SS119 PROTECTOR
D201 1SS119 PROTECTOR
D301 1SS119 PROTECTOR
D105 RD6.2ESB
D205 RD6.2ESB
D305 RD6.2ESB
D5 1SS119 ABL
D6 RD12ESB2 OVER LOAD LED DRIVE
Q1 DTC143TS OVER LOAD LED DRIVE
Q3 2SC403SP PULSE SHAPING
Q2 2SC403SP PULSE SHAPING
CP102
CP103
CP202
CP203
CP302
CP303
100K
TP1
GND
+12V
-12V
A7 B MP BK-1
A5 R OUT BK-1
A20 +12V
B20 +12V
A17 R SW HA-3
A3 B.CL.P BG A-7
BH A-16
BJ B-17
A11 B MP BK-2
A9 G OUT BK-2
A1 E
B1 E
A22 E
B22 E
A18 G SW HA-3
A16 BLUE OUT BC/BD/BM A-18
A15 B MP BK-3
A13 B OUT BK-3
A21 -12V
B21 -12V
A19 B SW B4 A9
HA-3
B19 DRIVE P BJ B-19
A2 OVER LOAD HB-4
B17 D.CL.P BC/BD/BM B-17
BJ B-18
B16 BM.CL.P BJ A-19

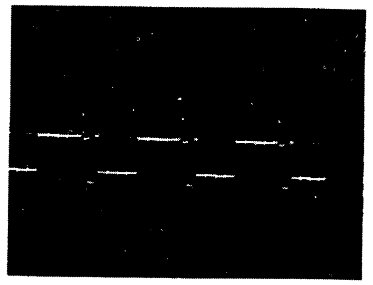
BI BOARD

IC1	RC4558DQ	ABL
101(1/3)	TC4053BP	SCREEN OFF SW
(2/3)		AGC PULSE GEN
(3/3)		AGC PULSE INSERT
102	TX-429M	GAIN CONTROL
103(1/2)	TL082CP	GAIN CONTROL
(2/2)		BIAS CONTROL
104	TL082CP	AMP
105(1/2)	TL082CP	I-V CONVERTER
(2/2)		CURRENT FEEDBACK CONTROL
201(1/3)	TC4053BP	SCREEN OFF SW
(2/3)		AGC PULSE GEN
(3/3)		AGC PULSE INSERT
202	TX-429M	GAIN CONTROL
203(1/2)	TL082CP	GAIN CONTROL
(2/2)		BIAS CONTROL
204	TL082CP	AMP
205(1/2)	TL082CP	I-V CONVERTER
(2/2)		CURRENT FEEDBACK CONTROL
301(1/3)	TC4053BP	SCREEN OFF SW
(2/3)		AGC PULSE GEN
(3/3)		AGC PULSE INSERT
302	TX-429M	GAIN CONTROL
303(1/2)	TL082CP	GAIN CONTROL
(2/2)		BIAS CONTROL
304	TL082CP	AMP
305(1/2)	TL082CP	I-V CONVERTER
(2/2)		CURRENT FEEDBACK CONTROL
Q1	DTC143TS	OVER LOAD LED DRIVE
2	2SC403SP	PULSE SHAPING
3	2SC403SP	PULSE SHAPING
11	2SC2878	G2 CONTROL
12	2SC2878	G2 CONTROL
13	2SC2878	G2 CONTROL
14	2SC2878	G2 CONTROL
15	DTA144ES	G2 CONTROL
101	2SA844	LIMITER
102	2SA844	LIMITER
103	2SA844	LIMITER
105	2SK381	GAIN CONTROL
106	2SA844	AMP
107	2SC2668	AMP
108	2SA844	AMP
109	2SK381	SAMPLE-HOLD

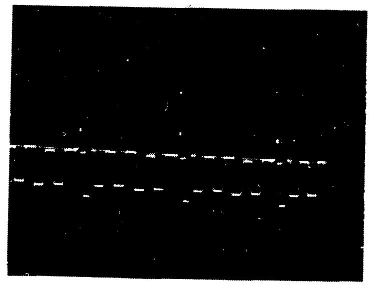
Q110	2SK381	SAMPLE-HOLD
113	2SK381	SAMPLING
114	2SA1091	CLAMP BIAS CONTROL
201	2SA844	LIMITER
202	2SA844	LIMITER
203	2SA844	LIMITER
205	2SK381	GAIN CONTROL
206	2SA844	AMP
207	2SC2668	AMP
208	2SA844	AMP
209	2SK381	SAMPLE-HOLD
210	2SK381	SAMPLE-HOLD
213	2SK381	SAMPLING
214	2SA1091	CLAMP BIAS CONTROL
301	2SA844	LIMITER
302	2SA844	LIMITER
303	2SA844	LIMITER
305	2SK381	GAIN CONTROL
306	2SA844	AMP
307	2SC2668	AMP
308	2SA844	AMP
309	2SK381	SAMPLE-HOLD
310	2SK381	SAMPLE-HOLD
313	2SK381	SAMPLING
314	2SA1091	CLAMP BIAS CONTROL
D1	1SS119	PROTECTOR
2	1SS119	PROTECTOR
4	1SS119	ABL
5	1SS119	ABL
6	RD12ESB1	OVER LOAD LED DRIVE
7	1SS119	ABL
8	1SS119	G2 CONTROL
101	1SS119	PROTECTOR
102	MC932	PROTECTOR
103	RD4.3ES-T1B	LIMITER
104	1SS119	LIMITER
201	1SS119	PROTECTOR
202	MC932	PROTECTOR
203	RD4.3ES-T1B	LIMITER
204	1SS119	LIMITER
301	1SS119	PROTECTOR
302	MC932	PROTECTOR
303	RD4.3ES-T1B	LIMITER
304	1SS119	LIMITER
D105	RD6.2ESB	
D205	RD6.2ESB	
D305	RD6.3ESB	



①1.2 Vp-p(H)



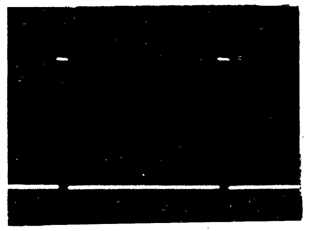
②1.2 Vp-p(H)



③1.2 Vp-p(H)

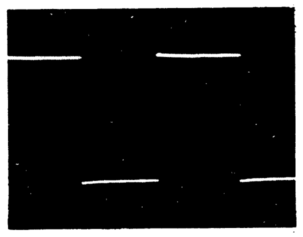
BJ BOARD

IC1	HD14538BP	PIC.SET.PULSE GEN
2	MC14001BCP	CROSS HATCH GEN
3	TC4040BP	V SYNC & DELAY
4	TC4040BP	V COUNT
5	TC504027BP	V SYNC & DELAY
6(1/2)	TC504027BP	CHROMA CLAMP PULSE GEN
(2/2)		2fH MULTI
7	TC504027BP	V COUNT
8	TC504027BP	1H PULSE PROCESS
9(1/2)	TC4027BP	V SYNC & DELAY
(2/2)		1H PULSE PROCESS
10(1/2)	HD14538BP	B.G.P GEN 2
(2/2)		H CYCLE
11(1/2)	HD14538BP	CROSS HATCH GEN
(2/2)		SPLIT Y BLK, C BLK PULSE GEN
12	HD14538BP	Y CYCLE AGC & CLAMP PULSE GEN
13(1/4)	MC14001BCP	CHROMA CLAMP PULSE GEN
(2/4)		Y.CL.P GEN
(3/4)		B.G.P GEN 2
(4/4)		RESIDUAL PULSE GEN
14(1/4)	MC14001BCP	SPLIT Y BLK: C BLK PULSE GEN
(3/4)		
(4/4)		
(2/4)		V CYCLY AGC & CLAMP PULSE GEN
15	MC14071BCP	V CYCLE AGC & CLAMP PULSE GEN
16(1/4)	MC14011BCP	CROSS HATCH GEN
(2/4)		Y CYCLE AGC & CLAMP PULSE GEN
(3/4)		H OR V BLK, P
(4/4)		SPLIT Y BLK, C BLK PULSE GEN
17	MC14011BCP	CROSS HATCH GEN
18	TC4023BP	CROSS HATCH GEN
19(1/4)	MC14081BCP	V COUNT
(2/4)		V SYNC & DELAY
(3/4)		2fH MULTI
(4/4)		1H PULSE PROCESS
20	MC14081BCP	V COUNT
21(1/4)	MC14071BCP	V CYCLE AGC & CLAMP PULSE GEN
(2/4)		V SYNC & DELAY
(3/4)		
(4/4)		V COUNT
22(1/4)	MC14071BCP	2fH MULTI
(2/4)		V COUNT
(3/4)		
(4/4)		V SYNC & DELAY
IC23(1/3)	TC4073BP	V SYNC & DELAY
(2/3)		
(3/3)		V COUNT
24(1/5)	MC14069UBCP	V SYNC & DELAY
(4/5)		
(2/5)		CROSS HATCH GEN
(3/5)		
(5/5)		V COUNT
25(1/6)	MC14069UBCP	1H PULSE PROCESS
(2/6)		INV
(3/6)		H OR V BLK.P
(4/6)		Y CYCLE AGC & CLAMP PULSE GEN
(5/6)		CROSS HATCH GEN
(6/6)		
26	MC14175BCP	1H PULSE PROCESS
27(1/3)	MC14053BCP	CLAMP PULSE CHANGE SW
(2/3)		CROSS HATCH GEN
(3/3)		H OR V DL SW
28	TC4520BP	CROSS HATCH GEN
29(1/2)	HD14538BP	B.G.P GEN 1
(2/2)		Y.CL.P GEN
Q14	2SC2785	CROSS HATCH GEN
15	2SC2785	Y.CL.P GEN
16	2SC2785	Y.CL.P GEN
17	2SC2785	CHROMA CLAMP PULSE GEN
18	2SC2785	CHROMA CLAMP PULSE GEN
19	2SA1115	H CYCLE
20	2SC2785	H CYCLE
21	2SC2785	H CYCLE
22	2SC2785	H CYCLE
23	2SA1048	H CYCLE
24	2SC2785	H CYCLE
25	2SC2785	CHROMA CLAMP PULSE GEN
26	2SC2785	Y.CL.P GEN
D1	1SS119	CROSS HATCH GEN
2	1SS119	H CYCLE
3	1SS119	H CYCLE
7	1SS119	1H PULSE PROCESS
8	1SS119	V SYNC & DELAY
9	1SS119	2fH MULTI
11	MC932	PROT



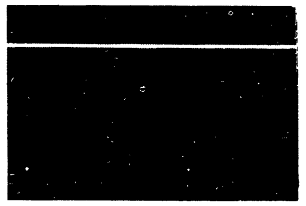
① 12Vp-p (H)

② 12Vp-p (H)

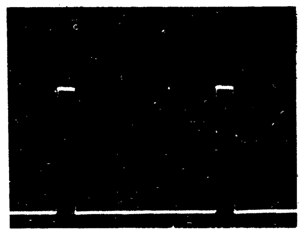


④ 12Vp-p (H)

⑤ 12Vp-p (H)

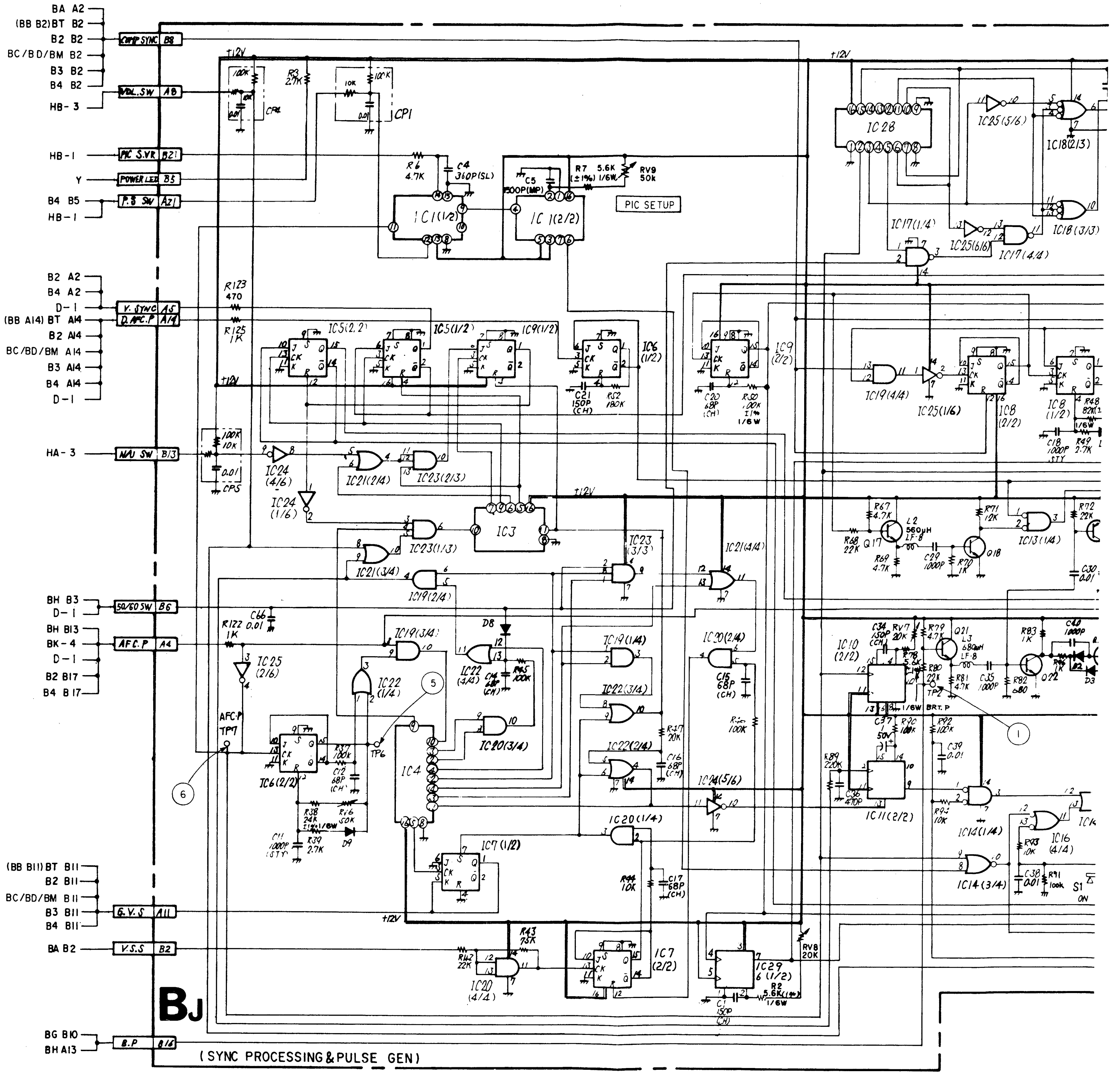


③ 12Vp-p (V)

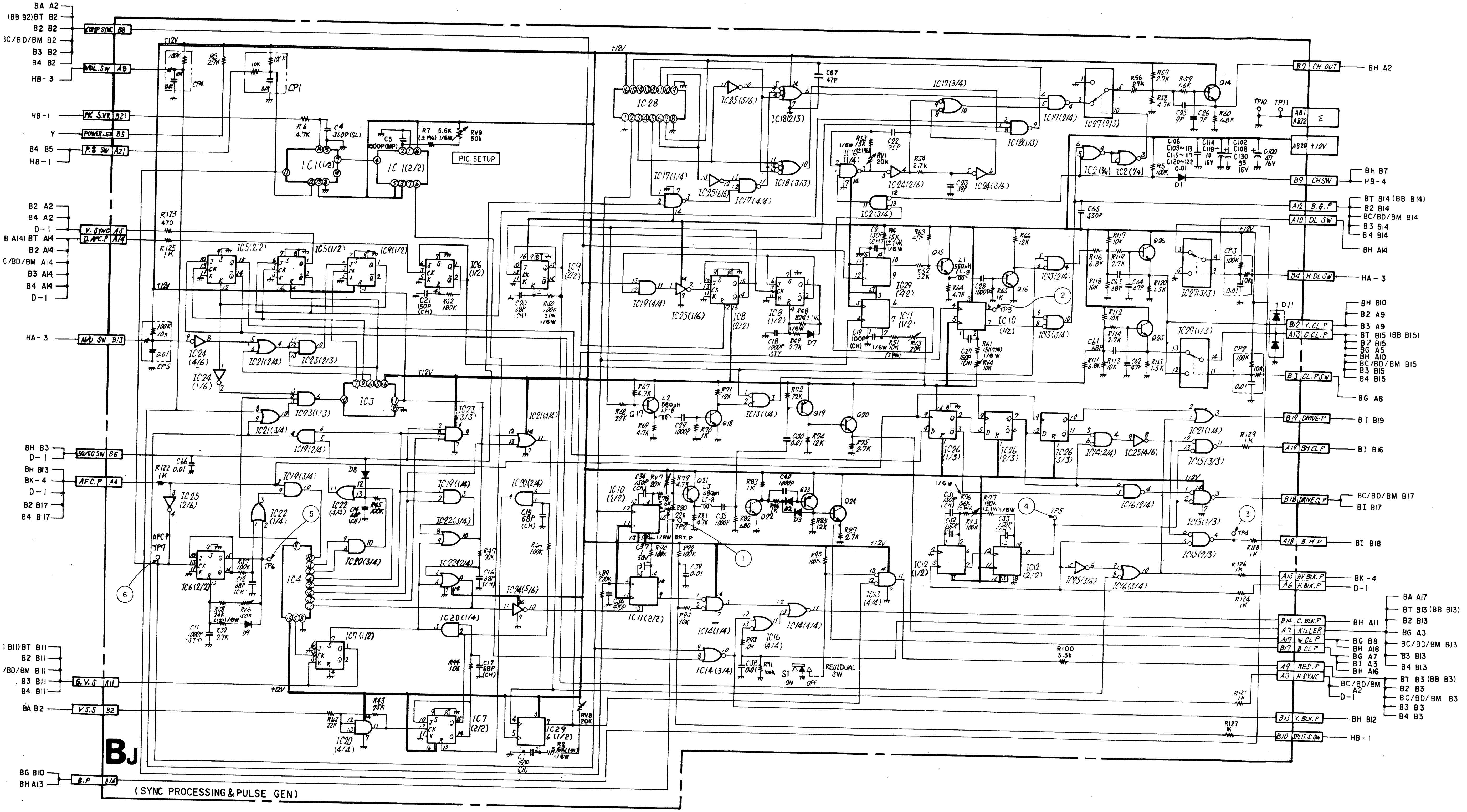


⑥ 12Vp-p (H)

BJ board (SYNC PROCESSING & PULSE GEN)

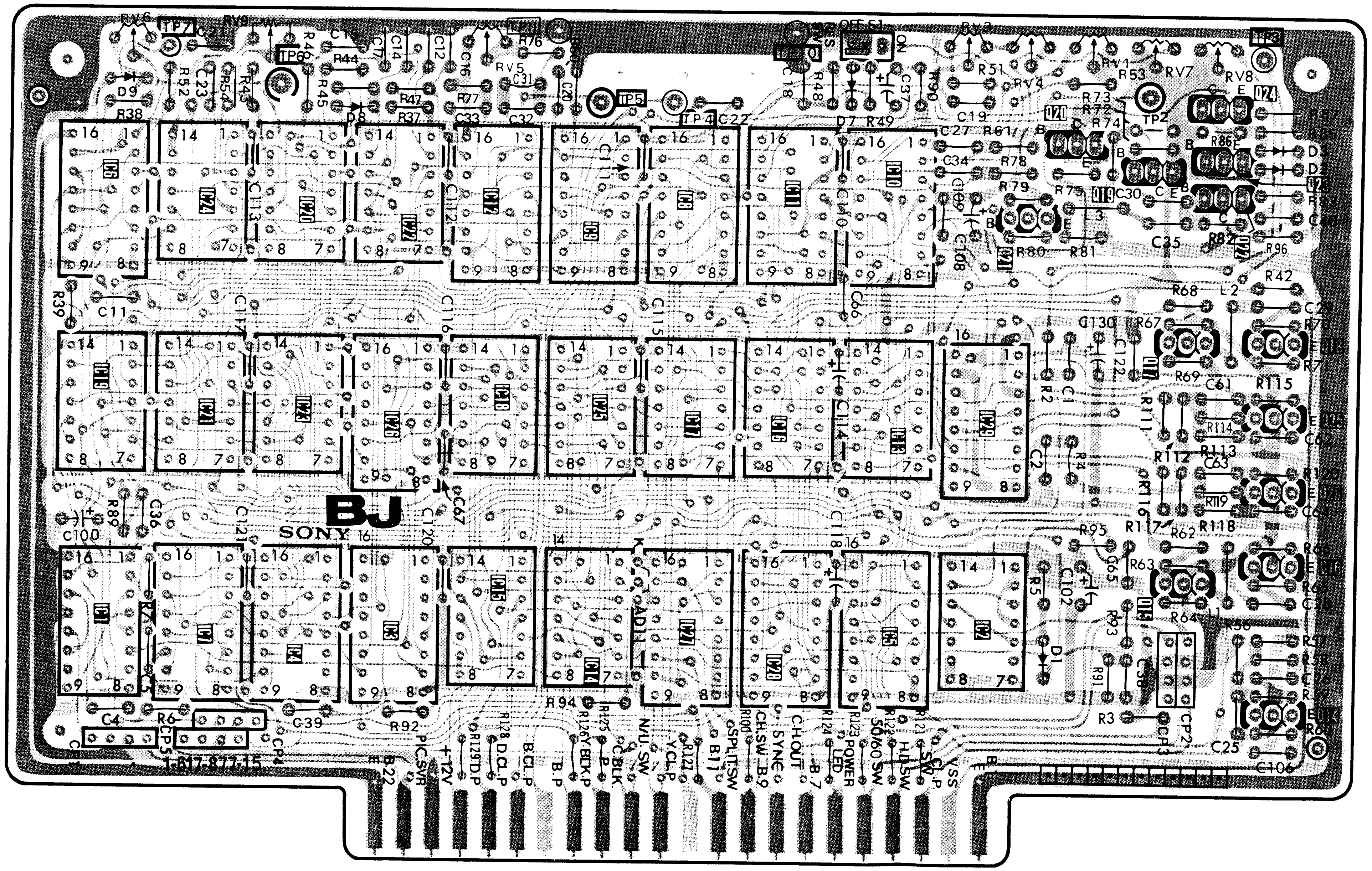

BA A2
(BB B2) BT B2
B2 B2
BC/BD/BM B2
B3 B2
B4 B2
HB-3
HB-1
Y
B4 B5
HB-1
B2 A2
B4 A2
D-1
(BB A14) BT A14
B2 A14
BC/BD/BM A14
B3 A14
B4 A14
D-1
HA-3
BH B3
D-1
BH B13
BK-4
D-1
B2 B17
B4 B17
(BB B11) BT B11
B2 B11
BC/BD/BM B11
B3 B11
B4 B11
BA B2
BG B10
BH A13
COMP SYNC B8
VDL SW A8
PIC S.VR B21
POWER LED B5
P.S SW A21
V.SYNC A5
D.AFC.P A14
H/V SW B13
50/60 SW B6
AFC.P A4
G.V.S A11
V.S.S B2
B.P B14
+12V
CP1
IC1(1/2)
IC1(2/2)
PIC SETUP
R6 4.7K
C4 360P(SL)
C5 500P(MP)
R7 5.6K (±1%) 1/6W
RV9 50k
IC28
IC25(5/6)
IC18(2/3)
IC17(1/4)
IC25(6/6)
IC18(3/3)
IC17(4/4)
R123 470
R125 1K
IC5(2/2)
IC5(1/2)
IC9(1/2)
IC6(1/2)
IC9(2/2)
C21 150P (CH)
R52 180K
C20 68P (CH)
R50 100K 1/6W
IC19(4/4)
IC25(1/6)
IC8(2/2)
IC8(1/2)
R48 82K
C18 1000P
R49 2.7K
CP5
IC24(4/6)
IC21(2/4)
IC23(2/3)
IC24(1/6)
IC3
IC23(3/3)
IC21(4/4)
IC23(1/3)
IC21(3/4)
IC19(2/4)
R67 4.7K
L2 560μH LF-8
Q17
R68 22K
R69 4.7K
C29 1000P
R70 1K
Q18
R71 12K
IC13(1/4)
R72 22K
C30 0.01
C66
R122 0.01 1K
IC25 (2/6)
IC19(3/4)
D8
IC22 (4/4)
IC22 (1/4)
IC19(1/4)
IC20(2/4)
C15 68P (CH)
IC22(3/4)
IC20(3/4)
IC22(2/4)
C16 68P
IC24(5/6)
AFC.P TP7
TP6
IC4
IC6(2/2)
R37 100K
C12 68P (CH)
R38 24K
R16 50K
C11 1000P
R39 2.7K
D9
IC7(1/2)
IC20(1/4)
R44 10K
C17 68P (CH)
C34 150P (CH)
RV7 20K
R79 4.7K
Q21
L3 680μH LF-8
R83 1K
C40 1000P
IC10 (2/2)
R80 220K
R81 4.7K
C35 1000P
Q22
D3
TP2
C37 50V
R90 18K
R92 120K
C39 0.01
R89 220K
C36 470P
IC11(2/2)
R93 10K
IC14(1/4)
R95 10K
IC16 (4/4)
IC14(3/4)
C38 0.01
R91 100k
S1
ON
R43 75K
R42 22K
IC20 (4/4)
IC7 (2/2)
IC29 (1/2)
RV8 20K
R2 5.6K (±1%) 1/6W
C1 150P (CH)
BJ
(SYNC PROCESSING & PULSE GEN)

BJ board (SYNC PROCESSING & PULSE GEN)


BA A2
(BB B2) BT B2
B2 B2
BC/BD/BM B2
B3 B2
B4 B2
HB-3
HB-1
Y
B4 B5
HB-1
COMP SYNC B8
VDL.SW A8
PIC S.YR B21
POWER LED B5
P.B SW A21
B2 A2
B4 A2
D-1
B AI4) BT A14
B2 A14
C/BD/BM A14
B3 A14
B4 A14
D-1
V. SYNC A5
D.AFC.P A14
HA-3
M/U SW B13
BH B3
D-1
BH B13
BK-4
D-1
B2 B17
B4 B17
50/60 SW B6
AFC.P A4
B11) BT B11
B2 B11
/BD/BM B11
B3 B11
B4 B11
G.V.S A11
BA B2
V.S.S B2
BG B10
BH A13
B.P B16
(SYNC PROCESSING & PULSE GEN)
BJ
+12V
IC1(1/2)
IC1(2/2)
PIC SETUP
CP1
IC28
IC25(5/6)
IC18(2/3)
IC17(3/4)
IC17(2/4)
IC18(1/3)
IC27(2/3)
Q14
TP10
TP11
C67 47P
IC17(1/4)
IC25(6/6)
IC17(4/4)
IC18(3/3)
IC16(1/4)
IC24(2/6)
IC24(3/6)
IC2(3/4)
IC2(1/4)
IC2(2/4)
D1
IC5(2/2)
IC5(1/2)
IC9(1/2)
IC6(1/2)
IC9(2/2)
IC19(4/4)
IC25(1/6)
IC8(2/2)
IC8(1/2)
D7
IC29(2/2)
IC11(1/2)
IC10(1/2)
IC13(2/4)
IC13(3/4)
Q15
Q16
TP3
Q26
Q25
IC27(3/3)
IC27(1/3)
CP3
CP2
DJ1
IC24(4/6)
IC21(2/4)
IC23(2/3)
IC24(1/6)
IC3
IC23(1/3)
IC21(3/4)
IC19(2/4)
IC23(3/3)
IC21(4/4)
Q17
Q18
IC13(1/4)
Q19
Q20
IC26(1/3)
IC26(2/3)
IC26(3/3)
IC14(2/4)
IC25(4/6)
IC21(1/4)
IC15(3/3)
IC19(3/4)
IC22(1/4)
IC22(4/4)
D8
IC19(1/4)
IC20(2/4)
IC25(2/6)
IC22(3/4)
IC20(3/4)
IC22(2/4)
AFC.P
TP7
TP6
IC6(2/2)
IC4
D9
IC24(5/6)
IC10(2/2)
Q21
Q22
Q23
Q24
D3
BRT.P
TP2
IC11(2/2)
IC14(1/4)
IC16(4/4)
IC14(4/4)
IC14(3/4)
S1
ON
OFF
RESIDUAL SW
IC16(2/4)
IC15(1/3)
TP5
TP4
IC15(2/3)
IC12(1/2)
IC12(2/2)
IC13(4/4)
IC25(3/6)
IC16(3/4)
IC7(1/2)
IC20(1/4)
IC7(2/2)
IC20(4/4)
IC29(1/2)
RV8 20K
R100 3.3k
1
2
3
4
5
6
B7 CH OUT
AB1
AB22
E
AB20 +12V
B9 CH SW
A12 B.G.P
A10 DL SW
B4 H.DL SW
B12 Y.CL.P
A13 C.CL.P
B3 CL.P.SW
B19 DRIVE.P
A19 BH CL.P
B18 DRIVE C.P
A18 B.M.P
A15 HV BLK.P
A6 H.BLK.P
B14 C.BLK.P
A7 KILLER
A17 W.CL.P
B17 B.CL.P
A9 RES.P
A3 H.SYNC
B16 Y.BLK.P
B10 SPLIT.C.SW
BH A2
BH B7
HB-4
BT B14 (BB B14)
B2 B14
BC/BD/BM B14
B3 B14
B4 B14
BH A14
HA-3
BH B10
B2 A9
B3 A9
BT B15 (BB B15)
B2 B15
BG A5
BH A10
BC/BD/BM B15
B3 B15
B4 B15
BG A8
B1 B19
B1 B16
BC/BD/BM B17
B1 B17
B1 B18
BK-4
D-1
BA A17
BT B13 (BB B13)
B2 B13
BG A3
BH A11
BG B8
BH A18
BG A7
B1 A3
BH A16
BC/BD/BM B13
B3 B13
B4 B13
BT B3 (BB B3)
BC/BD/BM A2
D-1
B2 B3
BC/BD/BM B3
B3 B3
B4 B3
BH B12
HB-1

BJ board (SYNC PROCESSING & PULSE GEN)

IC	6 19 1	24 21 7	20 23 4	22 26 3	12 18 15	9 25 14	8 17 27	11 16 28	10 13 5	29 2						
Q											21	20	19	17 15	24 23 22	18 25 26 16 14
D	9			8			11		7		1					3 2
TP ADJ	RV6	TP7	TP6		RV5	TP11 TP5	TP4	TP10		RV3	RV4	RV1	RV7 TP2	RV8		TP3

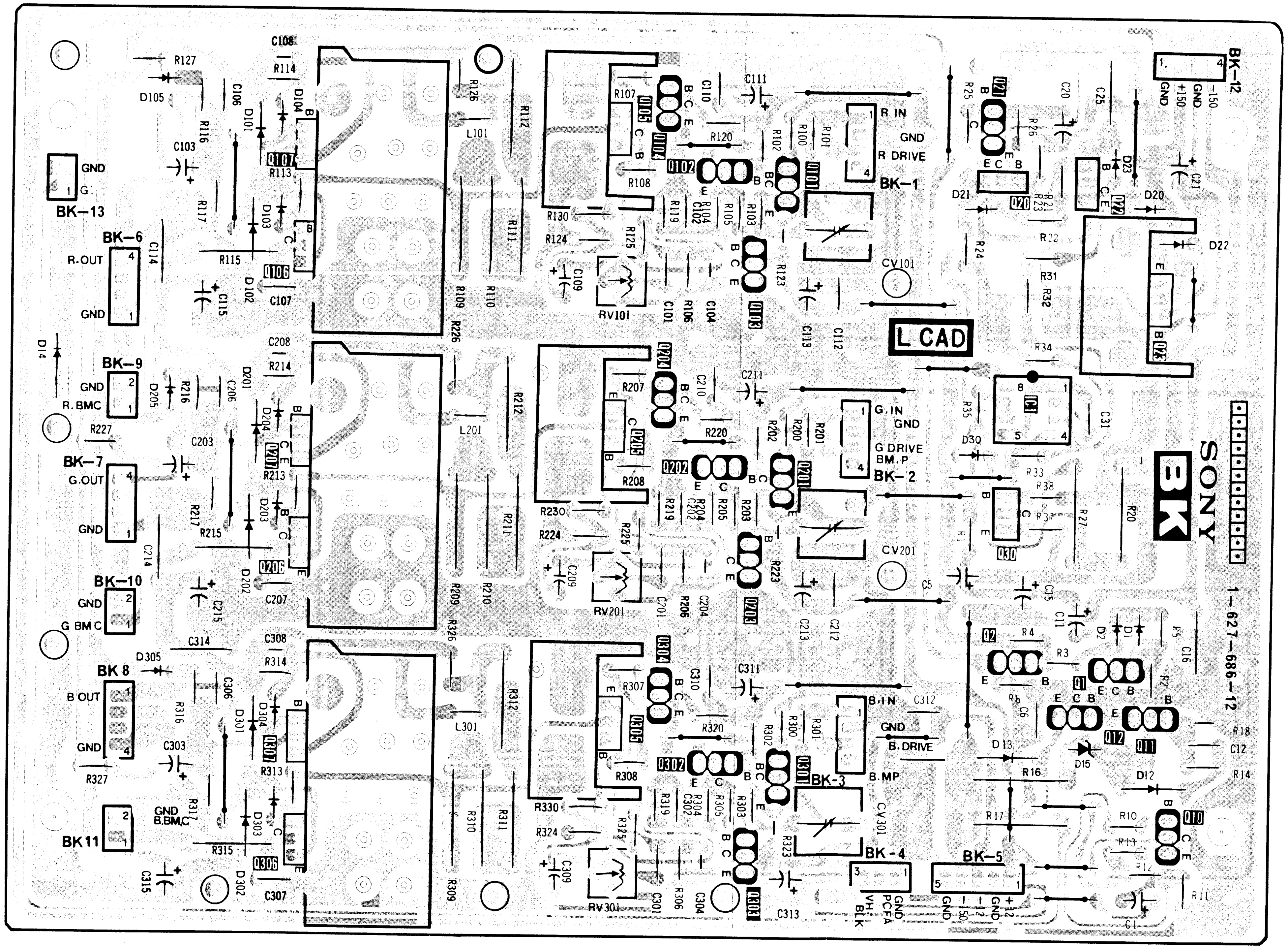

BJ
SONY
1-617-877-15
RV6
TP7
RV9
TP6
TP11
RV5
TP5
TP4
TP10
S1
RV3
RV4
RV1
RV7
RV8
TP3
TP2
B22
PIC.SWR
+12V
TD.P
D.CL.P
B.CL.P
B.P
Y.BLK.P
C.BLK
N/U.SW
Y.CL.P
B.11
SPLIT.SW
CK.SW
B.9
SYNC
C.H.OUT
B.7
POWER LED
50/60.SW
H.D.SW
S.CL.P
VSS

● ▨ : Conductor side pattern

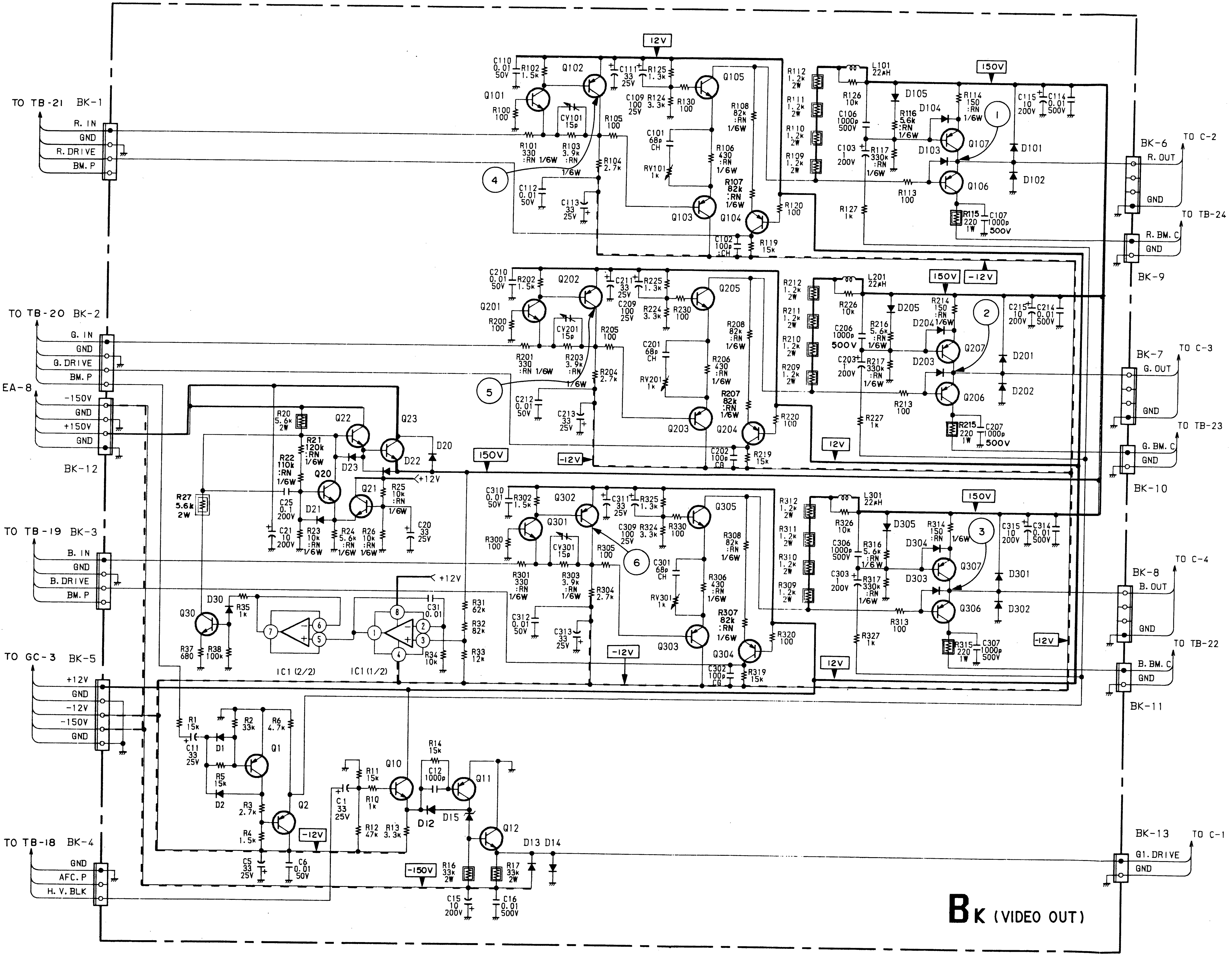
● ▨ : Component side pattern

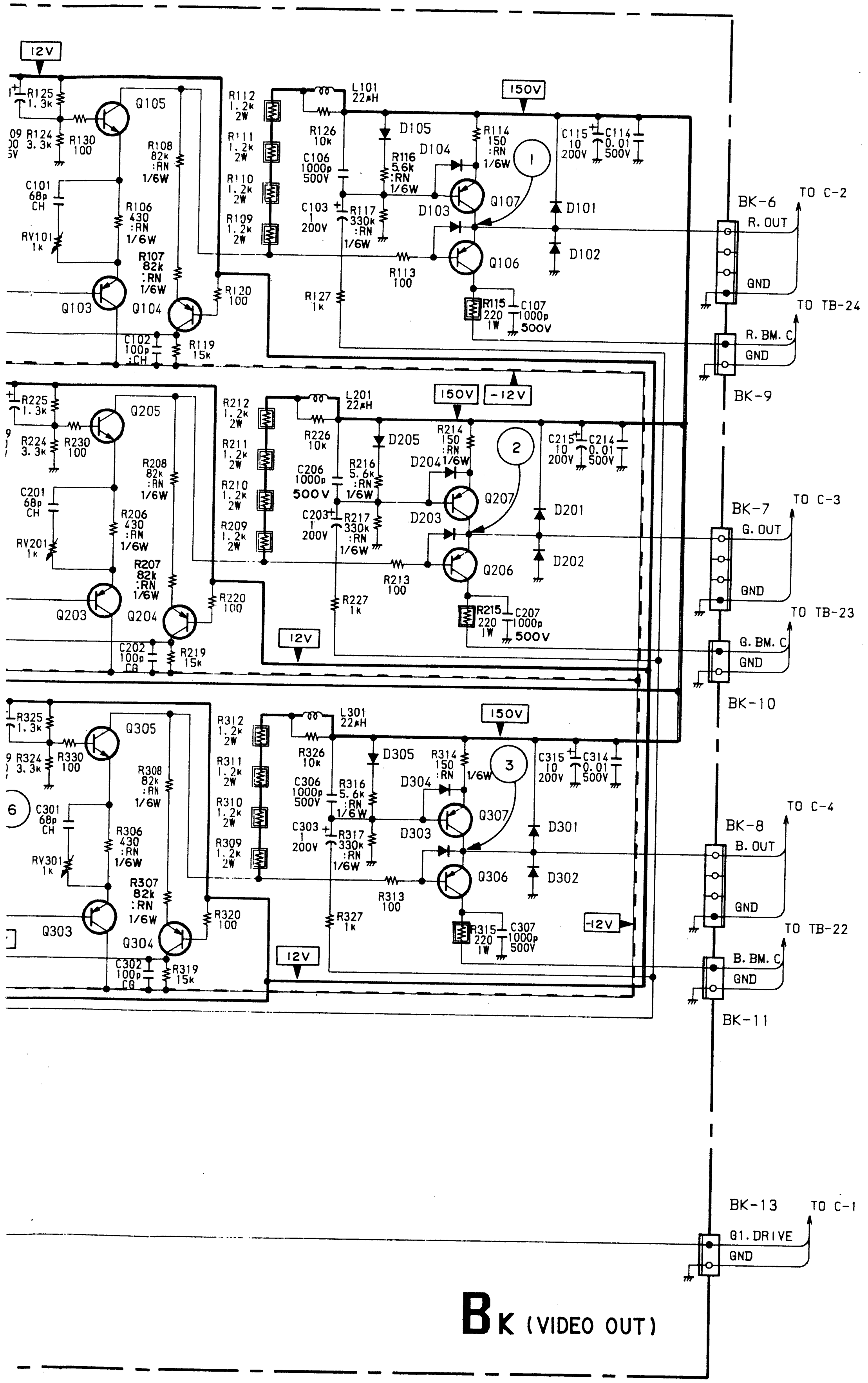
BK board (VIDEO OUT AMP)

IC							1	
Q			107 106 207 206 307 306	105 104 102 205 204 202 305 304 302	103 203 303	101 201 301	21 20 30 2	22 23 1 12 11 10
D	14	105 205 305	101 104 102 103 201 204 202 203 301 304 302 303				21 30 13	23 20 2 1 22 12 15
ADJ				RV101 RV301 RV201		CV101 CV301 CV201		


BK-13
GND
G
BK-6
R.OUT
GND
D14
BK-9
GND
R.BMC
BK-7
G.OUT
GND
BK-10
GND
G BMC
BK 8
B OUT
GND
BK11
GND
B.BMC
R127
D105
C108
R114
C106
D104
D101
R116
C103
R113
R117
D103
R115
C114
C115
D102
Q107
Q106
C107
C208
R214
D201
R216
C206
D205
R227
C203
D204
Q207
R213
R217
R215
D203
C214
Q206
D202
C215
C207
C314
C308
D305
R314
C306
D301
D304
R316
C303
Q307
R313
R327
R317
D303
R315
Q306
C315
D302
C307
R126
L101
R112
R111
R109
R110
R226
L201
R212
R211
R209
R210
R326
L301
R312
R310
R311
R309
R107
Q105
Q104
R108
R130
R124
R125
C109
RV101
C110
C111
R120
Q102
R102
R100
R101
Q101
R119
C102
R104
R105
R103
Q103
R123
C101
R106
C104
C113
C112
R IN
GND
R DRIVE
BK-1
CV101
L CAD
R207
Q204
Q205
R208
R230
R224
R225
C209
RV201
C210
C211
R220
Q202
R202
R200
R201
Q201
R219
C202
R205
R203
Q203
R223
C201
R206
C204
C213
C212
G.IN
GND
G DRIVE
BM.P
BK-2
CV201
R307
Q304
Q305
R308
R330
R324
R325
C309
RV301
C310
C311
R320
Q302
R302
R300
R301
Q301
R319
C302
R304
R305
R303
Q303
R323
C301
R306
C304
C313
B.IN
C312
GND
B. DRIVE
B.MP
BK-3
CV301
BK-4
VH BLK
PCFA
GND
BK-5
GND
-150
-12
GND
+12
R25
Q21
R26
C20
C25
D23
Q22
C21
D21
Q20
R21
R23
D20
R24
R22
D22
R31
R32
R34
R35
IC1
D30
C31
R33
R38
R37
Q30
R27
R20
R1
C5
C15
C11
D2
D1
R5
C16
Q2
R4
R3
Q1
R6
C6
P2
Q12
Q11
R18
D13
D15
C12
R16
D12
R14
R17
R10
Q10
R13
R12
R11
C1
BK-12
GND
+150
GND
SONY
BK
1-627-686-12

BK board (VIDEO OUT AMP)

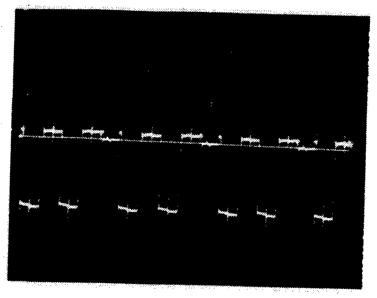

TO TB-21 BK-1
R. IN
GND
R. DRIVE
BM. P
TO TB-20 BK-2
G. IN
GND
G. DRIVE
BM. P
TO EA-8
-150V
GND
+150V
GND
BK-12
TO TB-19 BK-3
B. IN
GND
B. DRIVE
BM. P
TO GC-3 BK-5
+12V
GND
-12V
-150V
GND
TO TB-18 BK-4
GND
AFC. P
H. V. BLK
12V
150V
-12V
-150V
+12V
Q101
Q102
Q103
Q104
Q105
Q106
Q107
D101
D102
D103
D104
D105
L101 22μH
C110 0.01 50V
R102 1.5k
C111 33 25V
R125 1.3k
C109 100 25V
R124 3.3k
R130 100
R108 82k :RN 1/6W
R100 100
CV101 15p
R105 100
C101 68p CH
R101 330 :RN 1/6W
R103 3.9k :RN 1/6W
R104 2.7k
R106 430 :RN 1/6W
RV101 1k
R107 82k :RN 1/6W
C112 0.01 50V
C113 33 25V
C102 100p :CH
R119 15k
R120 100
R112 1.2k 2W
R111 1.2k 2W
R110 1.2k 2W
R109 1.2k 2W
R126 10k
C106 1000p 500V
R116 5.6k :RN 1/6W
C103 1 200V
R117 330k :RN 1/6W
R114 150 :RN 1/6W
C115 10 200V
C114 0.01 500V
R113 100
R127 1k
R115 220 1W
C107 1000p 500V
Q201
Q202
Q203
Q204
Q205
Q206
Q207
D201
D202
D203
D204
D205
L201 22μH
C210 0.01 50V
R202 1.5k
C211 33 25V
R225 1.3k
C209 100 25V
R224 3.3k
R230 100
R208 82k :RN 1/6W
R200 100
CV201 15p
R205 100
C201 68p CH
R201 330 :RN 1/6W
R203 3.9k :RN 1/6W
R204 2.7k
R206 430 :RN 1/6W
RV201 1k
R207 82k :RN 1/6W
C212 0.01 50V
C213 33 25V
C202 100p CG
R219 15k
R220 100
R212 1.2k 2W
R211 1.2k 2W
R210 1.2k 2W
R209 1.2k 2W
R226 10k
C206 1000p 500V
R216 5.6k :RN 1/6W
C203 1 200V
R217 330k :RN 1/6W
R214 150 :RN 1/6W
C215 10 200V
C214 0.01 500V
R213 100
R227 1k
R215 220 1W
C207 1000p 500V
Q301
Q302
Q303
Q304
Q305
Q306
Q307
D301
D302
D303
D304
D305
L301 22μH
C310 0.01 50V
R302 1.5k
C311 33 25V
R325 1.3k
C309 100 25V
R324 3.3k
R330 100
R308 82k :RN 1/6W
R300 100
CV301 15p
R305 100
C301 68p CH
R301 330 :RN 1/6W
R303 3.9k :RN 1/6W
R304 2.7k
R306 430 :RN 1/6W
RV301 1k
R307 82k :RN 1/6W
C312 0.01 50V
C313 33 25V
C302 100p CG
R319 15k
R320 100
R312 1.2k 2W
R311 1.2k 2W
R310 1.2k 2W
R309 1.2k 2W
R326 10k
C306 1000p 500V
R316 5.6k :RN 1/6W
C303 1 200V
R317 330k :RN 1/6W
R314 150 :RN 1/6W
C315 10 200V
C314 0.01 500V
R313 100
R327 1k
R315 220 1W
C307 1000p 500V
Q20
Q21
Q22
Q23
D20
D21
D22
D23
R20 5.6k 2W
R21 120k :RN 1/6W
R22 110k :RN 1/6W
C25 0.1 200V
C21 10 200V
R23 10k :RN 1/6W
R24 5.6k :RN 1/6W
R26 10k :RN 1/6W
R25 10k :RN 1/6W
C20 33 25V
R27 5.6k 2W
Q30
D30
R35 1k
R37 680
R38 100k
IC1 (2/2)
IC1 (1/2)
C31 0.01
R31 62k
R32 82k
R33 12k
R34 10k
Q1
Q2
D1
D2
R1 15k
C11 33 25V
R2 33k
R6 4.7k
R5 15k
R3 2.7k
R4 1.5k
C5 33 25V
C6 0.01 50V
Q10
Q11
Q12
R11 15k
C1 33 25V
R10 1k
R12 47k
R13 3.3k
R14 15k
C12 1000p
D12
D15
D13 D14
R16 33k 2W
R17 33k 2W
C15 10 200V
C16 0.01 500V
①
②
③
④
⑤
⑥
BK-6
TO C-2
R. OUT
GND
TO TB-24
R. BM. C
GND
BK-9
BK-7
TO C-3
G. OUT
GND
TO TB-23
G. BM. C
GND
BK-10
BK-8
TO C-4
B. OUT
GND
TO TB-22
B. BM. C
GND
BK-11
BK-13
TO C-1
G1. DRIVE
GND
BK (VIDEO OUT)

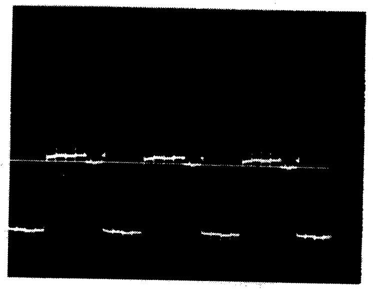

12V
150V
-12V
Q105
Q103
Q104
Q106
Q107
Q205
Q203
Q204
Q206
Q207
Q305
Q303
Q304
Q306
Q307
D101
D102
D103
D104
D105
D201
D202
D203
D204
D205
D301
D302
D303
D304
D305
L101 22μH
L201 22μH
L301 22μH
R112 1.2k 2W
R111 1.2k 2W
R110 1.2k 2W
R109 1.2k 2W
R126 10k
C106 1000p 500V
R116 5.6k :RN 1/6W
R114 150 :RN 1/6W
C115 10 200V
C114 0.01 500V
C103 1 200V
R117 330k :RN 1/6W
R113 100
R127 1k
R115 220 1W
C107 1000p 500V
R125 1.3k
R124 3.3k
R130 100
R108 82k :RN 1/6W
C101 68p CH
R106 430 :RN 1/6W
RV101 1k
R107 82k :RN 1/6W
R120 100
C102 100p :CH
R119 15k
BK-6
R. OUT
GND
TO C-2
TO TB-24
R. BM. C
BK-9
BK-7
G. OUT
TO C-3
TO TB-23
G. BM. C
BK-10
BK-8
B. OUT
TO C-4
TO TB-22
B. BM. C
BK-11
BK-13
G1. DRIVE
TO C-1
①
②
③
⑥

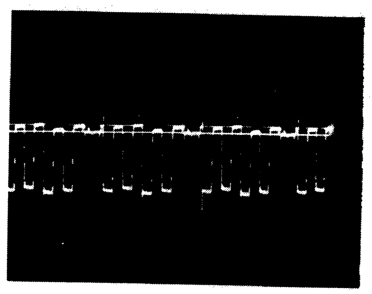
BK (VIDEO OUT)

BK BOARD

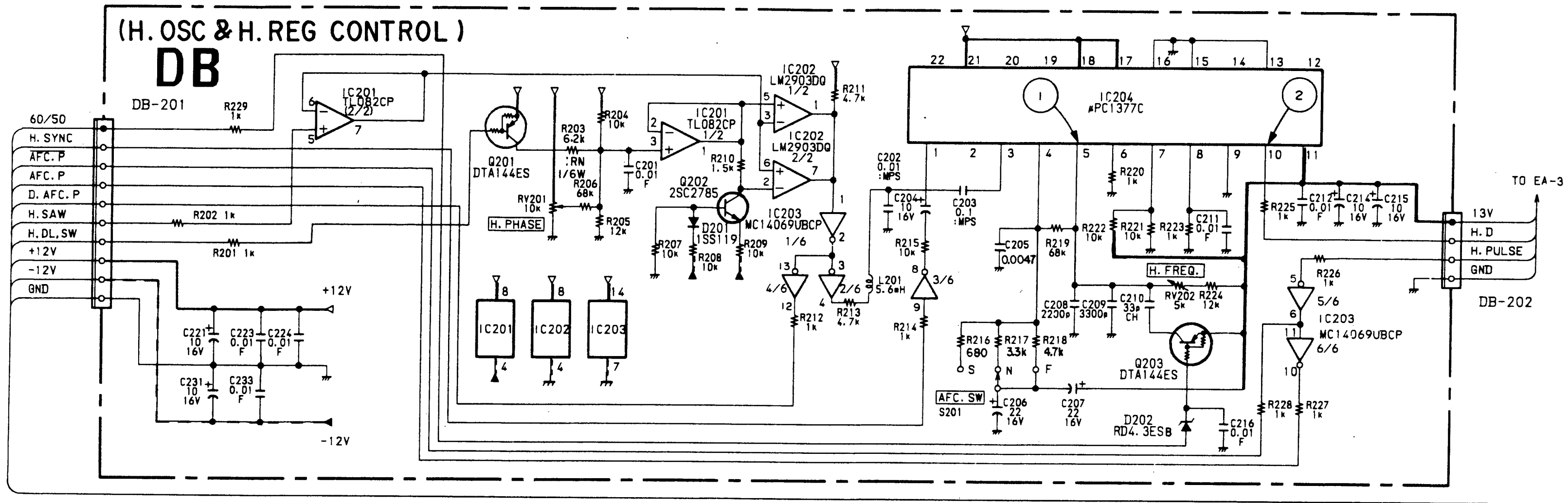
IC1	RC4558P	LIPPLE FILTER
Q1	2SA1175	INVERTER
2	2SA1175	BUFF.
10	2SC2785	BUFF.
11	2SA1091	BUFF.
12	2SC2551	BUFF.
20	2SC2688	LIPPLE FILTER
21	2SC3068	LIPPLE FILTER
22	2SC2688	LIPPLE FILTER
23	2SD669A	LIPPLE FILTER
30	2SC2688	LIPPLE FILTER
101	2SC2785	R-PRE AMP.
102	2SA1175	R-PRE AMP.
103	2SA844	BUFF.
104	2SA1091	BUFF.
105	2SC3956	BUFF.
106	2SA1142	R-VIDEO OUT
107	2SA1142	R-VIDEO OUT
201	2SC2785	G-PRE AMP.
202	2SA1175	G-PRE AMP.
203	2SA844	BUFF.
204	2SA1091	BUFF.
205	2SC3956	BUFF.
206	2SA1142	G-VIDEO OUT
207	2SA1142	G-VIDEO OUT
301	2SC2785	B-PRE AMP.
302	2SA1175	B-PRE AMP.
303	2SA844	BUFF.
304	2SC3950	BUFF.
305	2SC3956	BUFF.
306	2SA1142	B-VIDEO OUT
307	2SA1142	B-VIDEO OUT
D1	1SS133	INVERTER
2	1SS133	INVERTER
12	1SS83	
13	1SS83	BIAS
14	1SS83	PROTECTOR
30	1SS133	
101	1SS83	PROTECTOR
102	1SS83	PROTECTOR
103	1SS133	PROTECTOR
104	1SS133	PROTECTOR
105	1SS133	BIAS
201	1SS83	PROTECTOR
202	1SS83	PROTECTOR
203	1SS133	PROTECTOR
204	1SS133	PROTECTOR
205	1SS133	BIAS
301	1SS83	PROTECTOR
302	1SS83	PROTECTOR
303	1SS133	PROTECTOR
304	1SS133	PROTECTOR
305	1SS133	BIAS
15	RD20ES—TB	
20	ISS133	
22	ISS133	
23	ISS 133	
21	ISS 133	

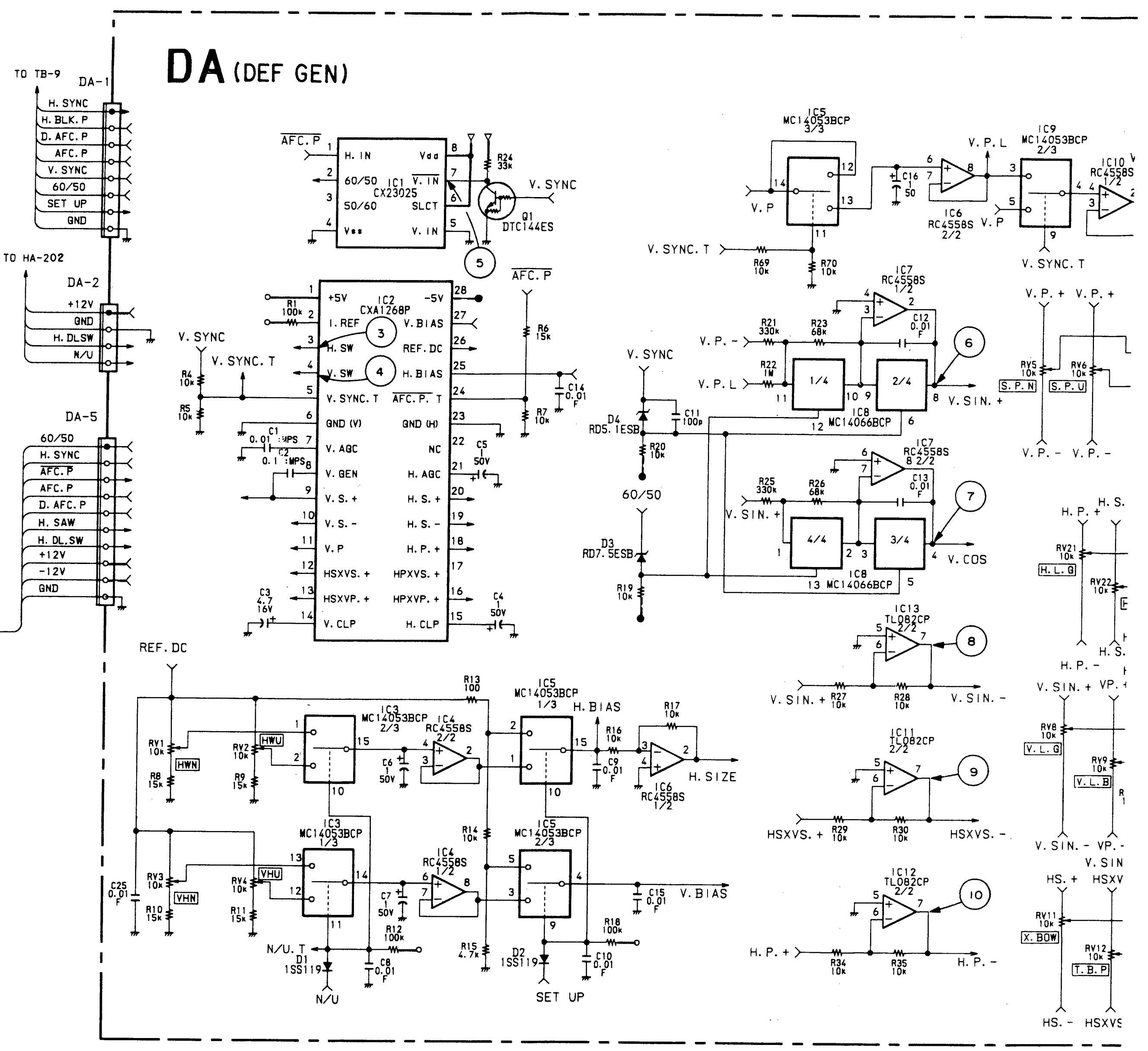

① 30 Vp-p(H)
④ 3 Vp-p(H)

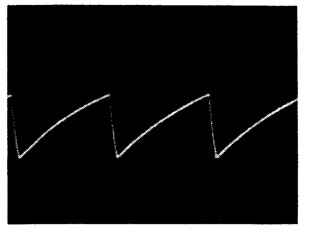

② 35 Vp-p(H)
⑤ 3.5 Vp-p(H)

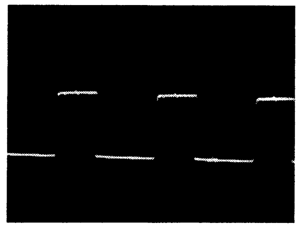

③ 30 Vp-p(H)
⑥ 3 Vp-p(H)

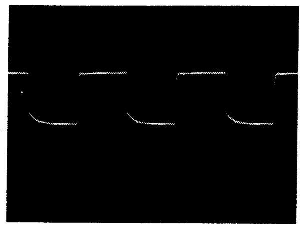
DA Board (DEF GEN)
DB Board (H.OSC & H.REG CONTROL)

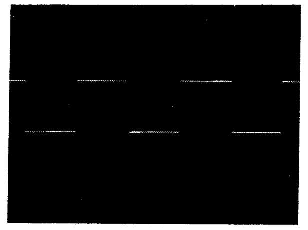

(H. OSC & H. REG CONTROL)
DB
DB-201
60/50
H. SYNC
AFC. P
AFC. P
D. AFC. P
H. SAW
H. DL. SW
+12V
-12V
GND
IC201 TL082CP 2/2
Q201 DTA144ES
IC201 TL082CP 1/2
IC202 LM2903DQ 1/2
IC202 LM2903DQ 2/2
Q202 2SC2785
D201 1SS119
IC203 MC14069UBCP
H. PHASE
IC204 μPC1377C
H. FREQ.
AFC. SW
S201
Q203 DTA144ES
D202 RD4.3ESB
IC203 MC14069UBCP 6/6
13V
H. D
H. PULSE
GND
DB-202
TO EA-3
+12V
-12V

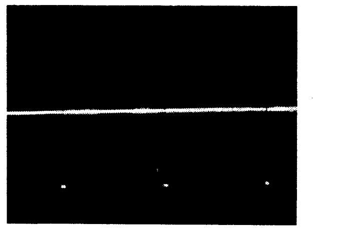

TO TB-9
DA-1
H. SYNC
H. BLK. P
D. AFC. P
AFC. P
V. SYNC
60/50
SET UP
GND
TO HA-202
DA-2
+12V
GND
H. DLSW
N/U
DA-5
60/50
H. SYNC
AFC. P
AFC. P
D. AFC. P
H. SAW
H. DL. SW
+12V
-12V
GND
DA (DEF GEN)
IC1 CX23025
Q1 DTC144ES
V. SYNC
IC2 CXA1268P
V. SYNC
V. SYNC. T
REF. DC
IC3 MC14053BCP
IC4 RC4558S
IC5 MC14053BCP
H. BIAS
H. SIZE
V. BIAS
N/U. T
D1 1SS119
N/U
D2 1SS119
SET UP
IC5 MC14053BCP 3/3
IC9 MC14053BCP 2/3
IC6 RC4558S 2/2
V. P. L
V. SYNC. T
IC7 RC4558S
IC8 MC14066BCP
V. SIN. +
V. COS
IC13 TL082CP 2/2
IC11 TL082CP 2/2
IC12 TL082CP 2/2
V. SIN. -
HSXVS. +
HSXVS. -
H. P. +
H. P. -
D4 RD5.1ESB
D3 RD7.5ESB
60/50
S. P. N
S. P. U
H. L. G
V. L. G
V. L. B
X. BOW
T. B. P

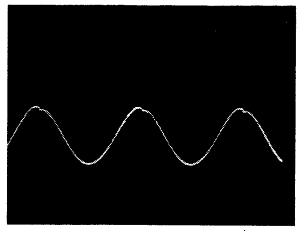

① 4.6Vp-p (H)

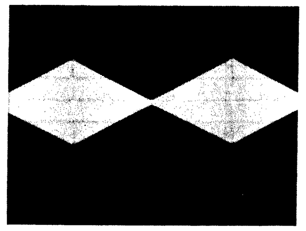

② 12Vp-p (H)

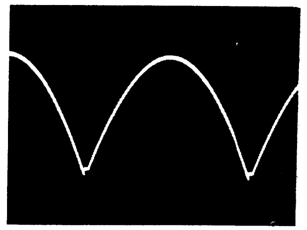

③ 3.3Vp-p (H)

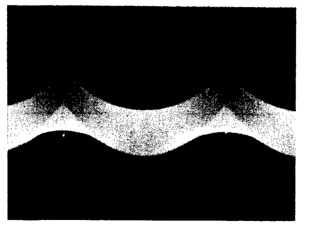

④ 3.3Vp-p (V)

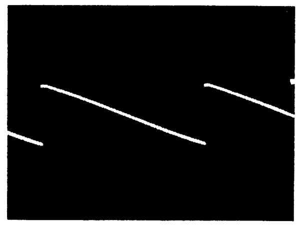

⑤ 12Vp-p (H)

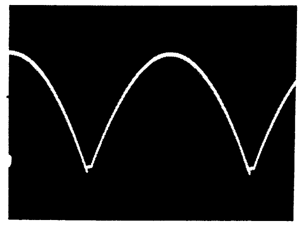

⑥⑧ 1Vp-p (V)
⑦ 0.9Vp-p (V)

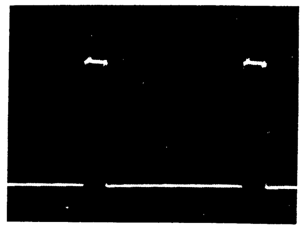

⑨ 1.8Vp-p (V)

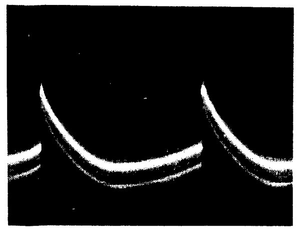

⑩ 2.3Vp-p (H)

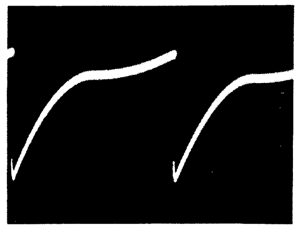

⑪ 9Vp-p (V)

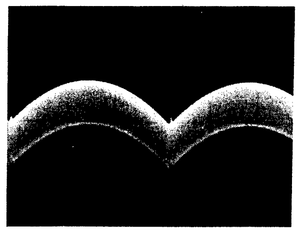

⑫ 3.6Vp-p (V)

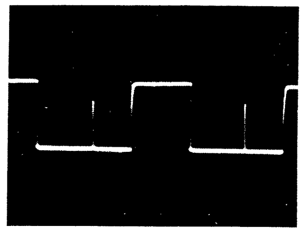

⑬ 0.9Vp-p (V)


⑭ 12Vp-p (H)

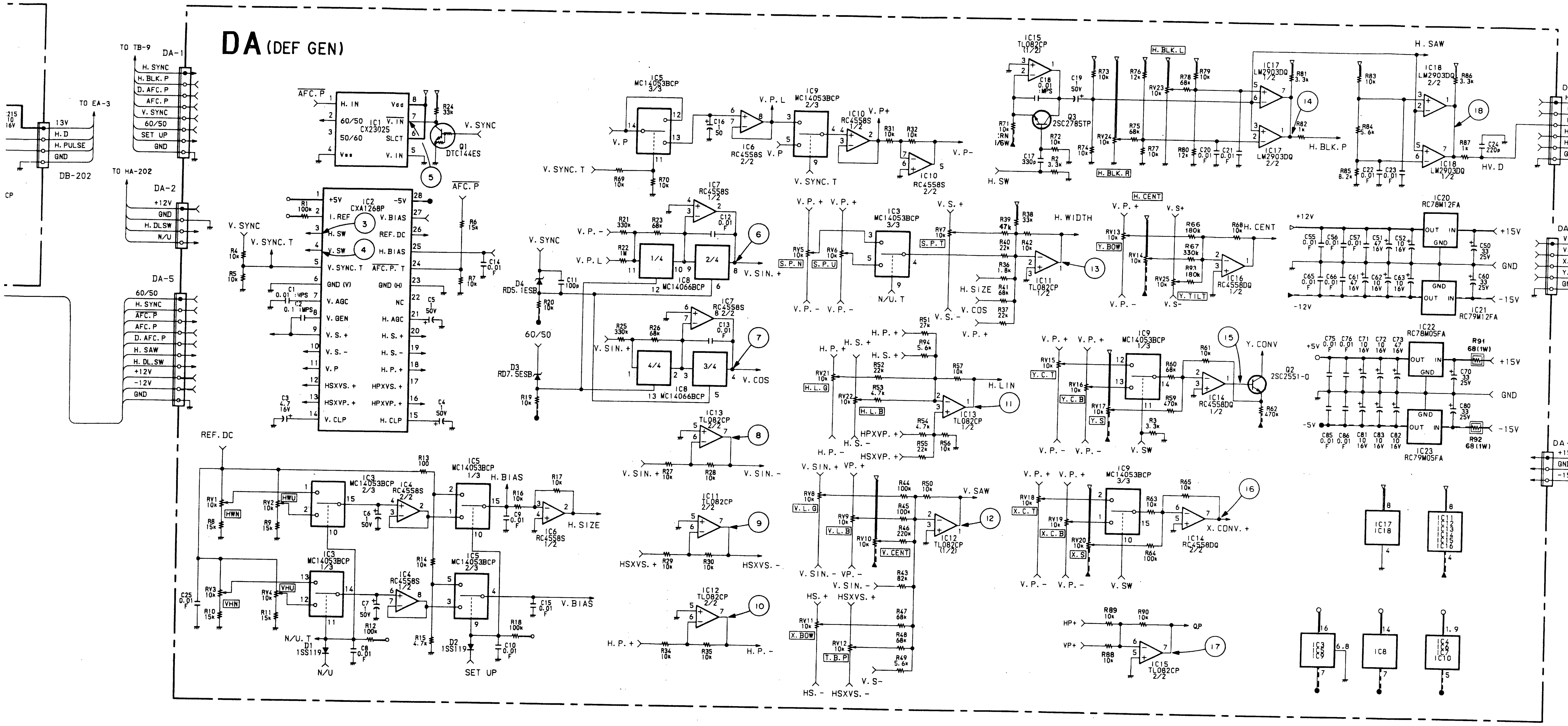

⑮ 0.1Vp-p (V)


⑯ 0.6Vp-p (V)


⑰ 3.6Vp-p (V)

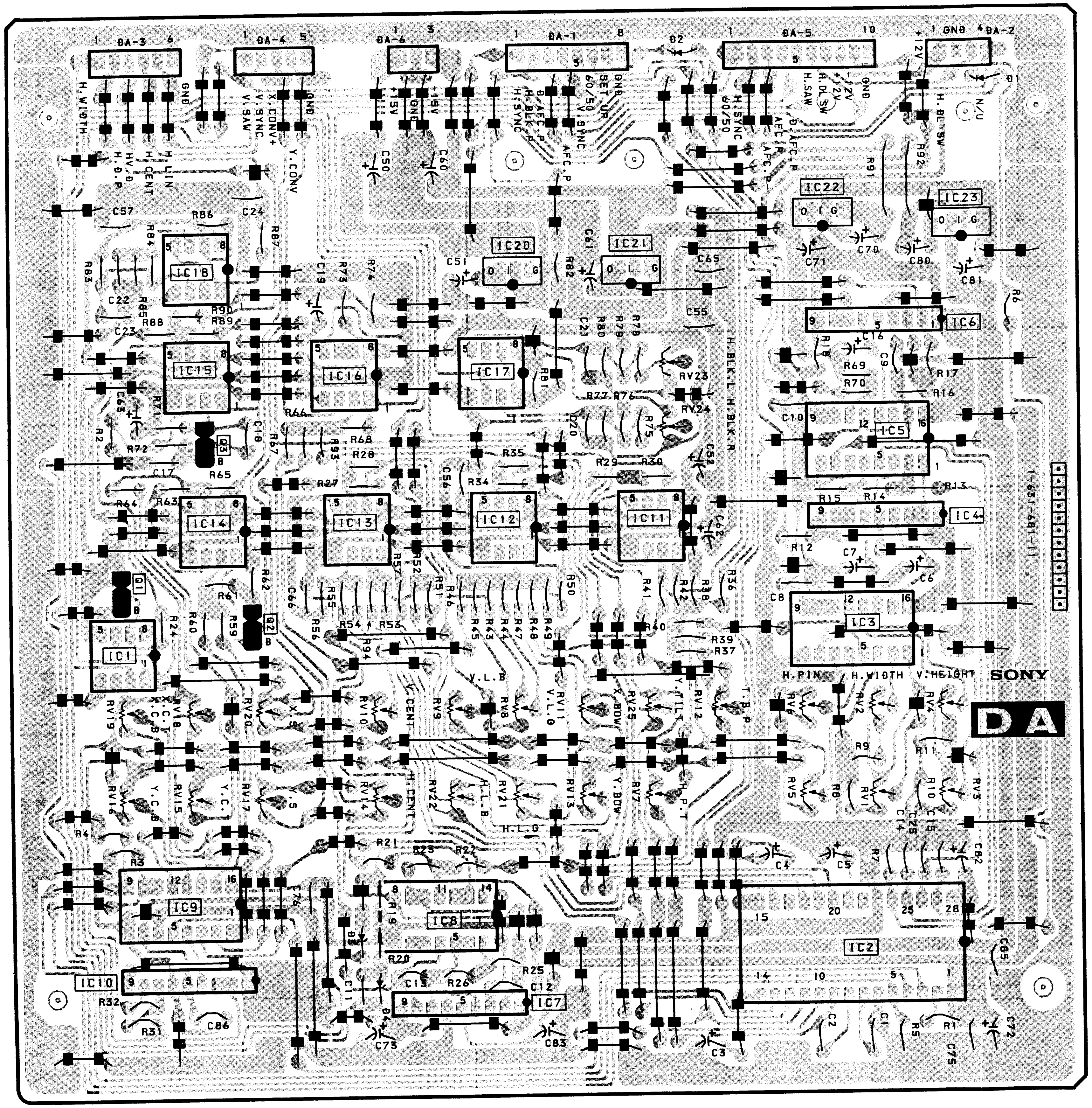

⑱ 7Vp-p (H)

5. DIAGRAMS

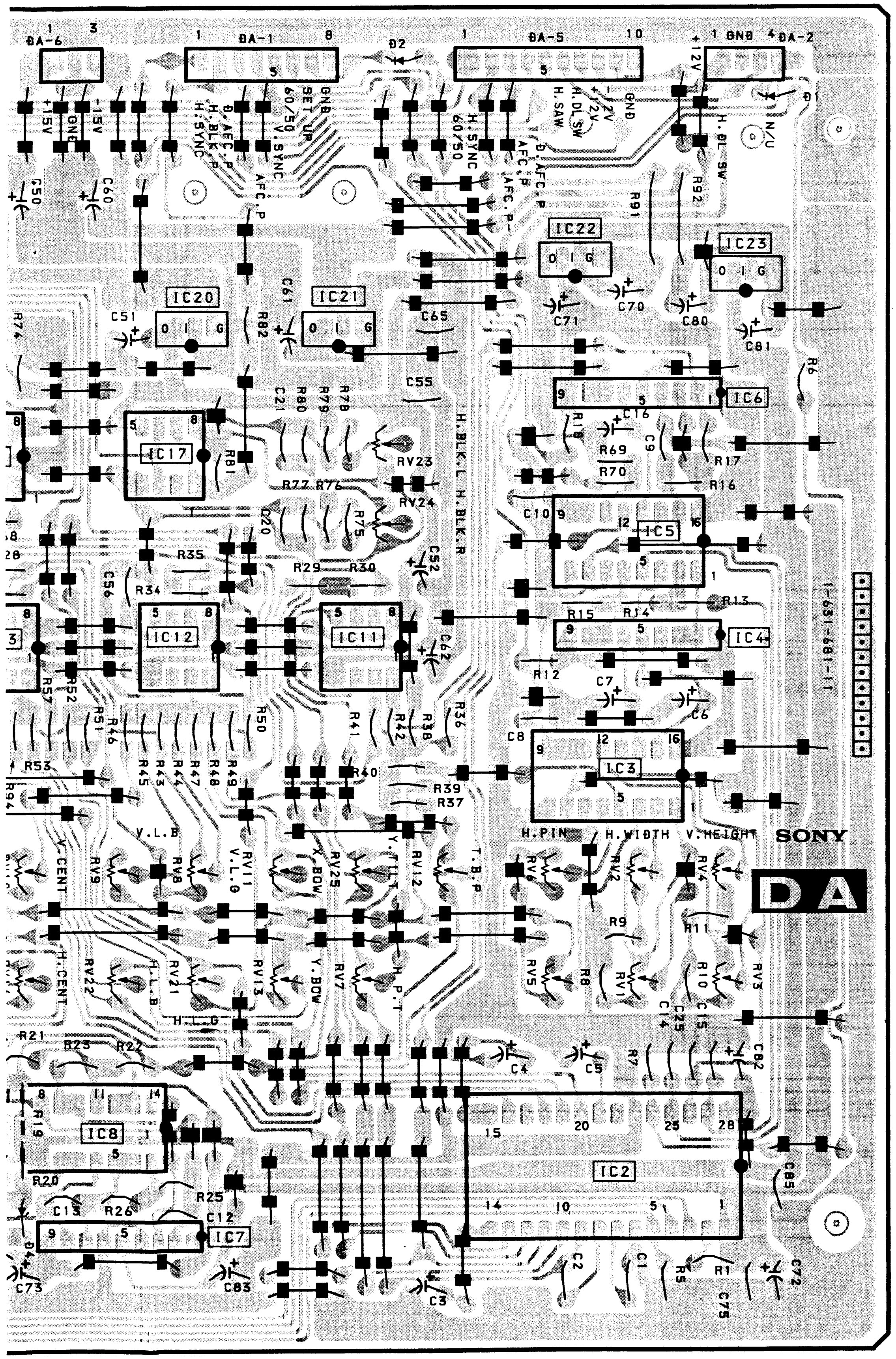

DA (DEF GEN)
TO TB-9
DA-1
H. SYNC
H. BLK. P
D. AFC. P
AFC. P
V. SYNC
60/50
SET UP
GND
TO EA-3
13V
H. D
H. PULSE
GND
DB-202
TO HA-202
DA-2
+12V
GND
H. DLSW
N/U
DA-5
60/50
H. SYNC
AFC. P
AFC. P
D. AFC. P
H. SAW
H. DL.SW
+12V
-12V
GND
IC1 CX23025
Q1 DTC144ES
V. SYNC
IC2 CXA1268P
AFC. P
V. SYNC
V. SYNC. T
REF. DC
IC3 MC14053BCP
IC4 RC4558S
IC5 MC14053BCP
H. BIAS
H. SIZE
IC6 RC4558S
V. BIAS
N/U. T
D1 1SS119
N/U
D2 1SS119
SET UP
V. P
V. SYNC. T
IC7 RC4558S
IC8 MC14066BCP
V. SIN. +
V. COS
V. SYNC
D4 RD5.1ESB
60/50
D3 RD7.5ESB
IC13 TL082CP
V. SIN. -
IC11 TL082CP
HSXVS. +
HSXVS. -
IC12 TL082CP
H. P. +
H. P. -
IC9 MC14053BCP
V. P. L
IC10 RC4558S
V. P+
V. P-
H. WIDTH
IC11 TL082CP
H. SIZE
V. COS
H. LIN
V. SAW
IC15 TL082CP
Q3 2SC2785TP
H. BLK. L
H. BLK. R
IC17 LM2903DQ
H. BLK. P
H. SAW
IC18 LM2903DQ
HV. D
H. CENT
IC16 RC4558DQ
Y. BOW
Y. TILT
Y. CONV
Q2 2SC2551-O
IC14 RC4558DQ
X. CONV. +
HP+
VP+
QP
IC20 RC78M12FA
IC21 RC79M12FA
IC22 RC78M05FA
IC23 RC79M05FA
+15V
GND
-15V
+12V
-12V
+5V
-5V
DA-3
TO EA-1
H. WIDTH
Q. P.
HV. D
H. CENT
H. LIN
GND
DA-4
TO EA-2
V. SAW
V. SYNC
X. CONV. +
Y. CONV
GND
DA-6
TO GA-6
+15V
GND
-15V

DA Board (DEF GEN)

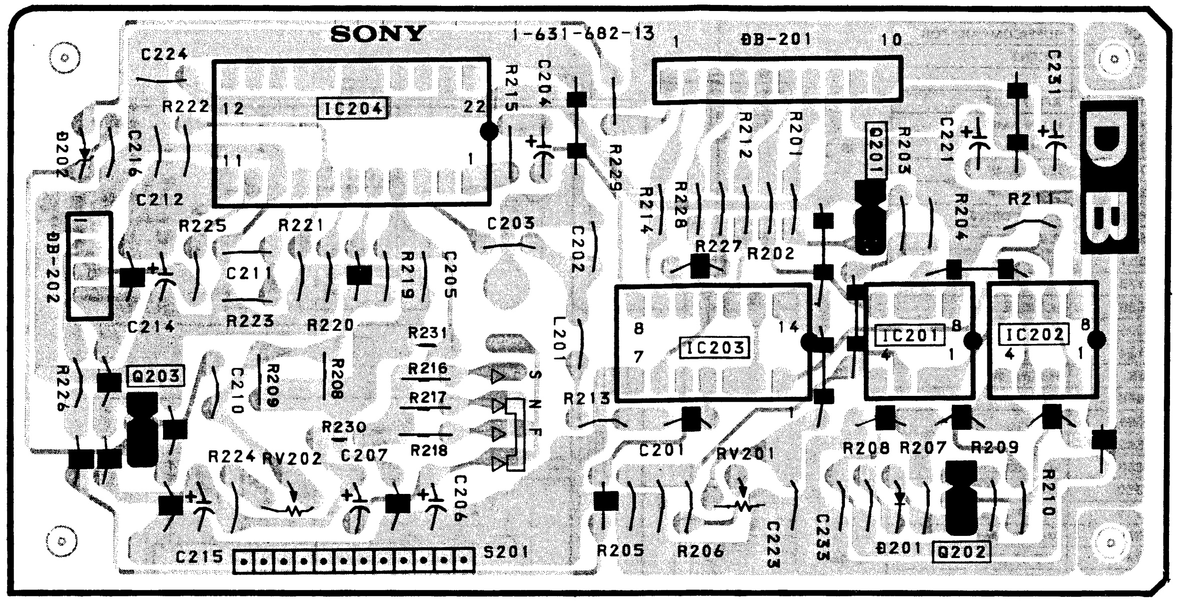
IC	Q	D	RV
		2 1	
22 23			
18 20,21			
6			
15, 16, 17			23
5			24
14, 12 13, 11, 4			
	1		
		2	
3 1			
			19 10 11 6 18 9 25 2 20 8 12 4
			16 14 13 5 15 22 7 1 17 21 3
9, 8			
		3	
2			
10		4	
7			



DA-3
DA-4
DA-6
DA-1
DA-5
GND DA-2
H.WIDTH
H.V.D
H.D.P
H.CENT
H.LIN
V.SAW
V.SYNC
X.CONV+
Y.CONV
+15V
GND
-15V
H.SYNC
H.BLK.P
D.AFC.P
60/50
V.SYNC
SET UP
AFC.P
H.SYNC
AFC.R
AFC.P
H.SAW
+12V
-12V
H.DL SW
H.BL SW
N/U
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
IC9
IC10
IC11
IC12
IC13
IC14
IC15
IC16
IC17
IC18
IC20
IC21
IC22
IC23
Q1
Q2
Q3
D1
D2
D3
D4
H.BLK.L
H.BLK.R
H.PIN
H.WIDTH
V.HEIGHT
V.L.B
V.L.G
X.BOW
Y.TILT
T.B.P
X.C.T
X.C.B
X.S
Y.CENT
Y.C.B
Y.C.T
Y.S
H.CENT
H.L.B
H.L.G
Y.BOW
H.P.T
1-631-681-11
SONY
DA


DA-6
DA-1
DA-5
DA-2
D2
D1
+15V
GND
-15V
C50
C60
IC20
IC21
IC22
IC23
IC17
IC12
IC11
IC6
IC5
IC4
IC3
IC8
IC2
IC7
C51
C61
C65
C71
C70
C80
C81
C55
RV23
RV24
R35
R34
R29
R30
C52
C62
H.BLK.L
H.BLK.R
1-631-681-11
H.PIN
H.WIDTH
V.HEIGHT
SONY
DA
V.L.B
V.L.G
V.CENT
H.CENT
Y.BOW
Y.TILT
T.B.P
H.L.B
H.L.G
H.P.T
C4
C5
C3
C1
C2
C72
C73
C75
C83
C85
C12
C13
R1
R5
R21
R25
R26

DB board (H.OSC & H.REG CONTROL)


SONY
1-631-682-13
DB-201
DB-202
DB
C224
R222
IC204
R215
C204
R229
R214
R228
R212
R201
Q201
R203
C221
R204
C231
R211
Q202
C216
C212
R225
R221
C203
C202
R227
R202
C211
R219
C205
C214
R223
R220
R231
L201
IC203
IC201
IC202
Q203
C210
R209
R208
R216
R217
R213
R226
R230
R224
RV202
C207
R218
C206
C201
RV201
R208
R207
R209
R210
C215
S201
R205
R206
C223
C233
D201
Q202

DA board

IC	1	CX23025	SYSTEM DETECTOR
	2	CXA1268P	SIGNAL GEN.
	3	MC14053BCP	SCAN SELECT/ADD H.WIDTH
	4	RC4558S	SCAN SELECT/ADD H.WIDTH
	5	MC14053BCP	SCAN SELECT/ADD H.WIDTH
	6	RC4558S	SCAN SELECT/ADD H.WIDTH
	7	RC4558S	SIN GEN./COS GEN.
	8	MC14066BCP	SIN GEN./COS GEN.
	9	MC14053BCP	ADD Y.CONV/ADD X.CONV
	10	RC4558S	
	11	TL082CP	SIGNAL GEN./ADD H.WIDTH
	12	TL082CP	SIGNAL GEN./ADD V.SAW
	13	TL082CP	SIGNAL GEN./ADD H.LIN.
	14	RC4558DQ	ADD Y CONV/ADD X.CONV
	15	TL082CP	H.SAW.GEN.
	16	RC4558DQ	ADD H.CENT
	17	LM2903DQ	
	18	LM2903DQ	H.V DRIVE PULSE GEN.
	20	RC78M12FA	+12V REG
	21	RC79M12FA	−12V REG
	22	RC78M05FA	+5V REG
	23	RC79M05FA	−5V REG
Q	1	DTC144ES	SYSTEM DETECTOR
	2	2SC2551	ADD Y CONV
	3	2SC2785	H.SAW.GEN.
D	1	1SS119	
	2	1SS119	
	3	RD7.5ES-B2	LIMITER
	4	RD5.1ES-B1	LIMITER
	5	1SS119	

DB board

IC	201	TL082CP	
	202	LM2903DQ	H DELAY/H PHASE
	203	TC4069UBP	H DELAY/H PHASE
	204	UPC1377C	H OSC/H AFC
Q	201	DTA144ES	H.PHASE
	202	2SC2785	H.PHASE
	203	DTA144ES	SYSTEM DETECTOR/AFC
D	201	1SS119	
	202	RD4.3ES-B1	SYSTEM DETECTOR/AFC

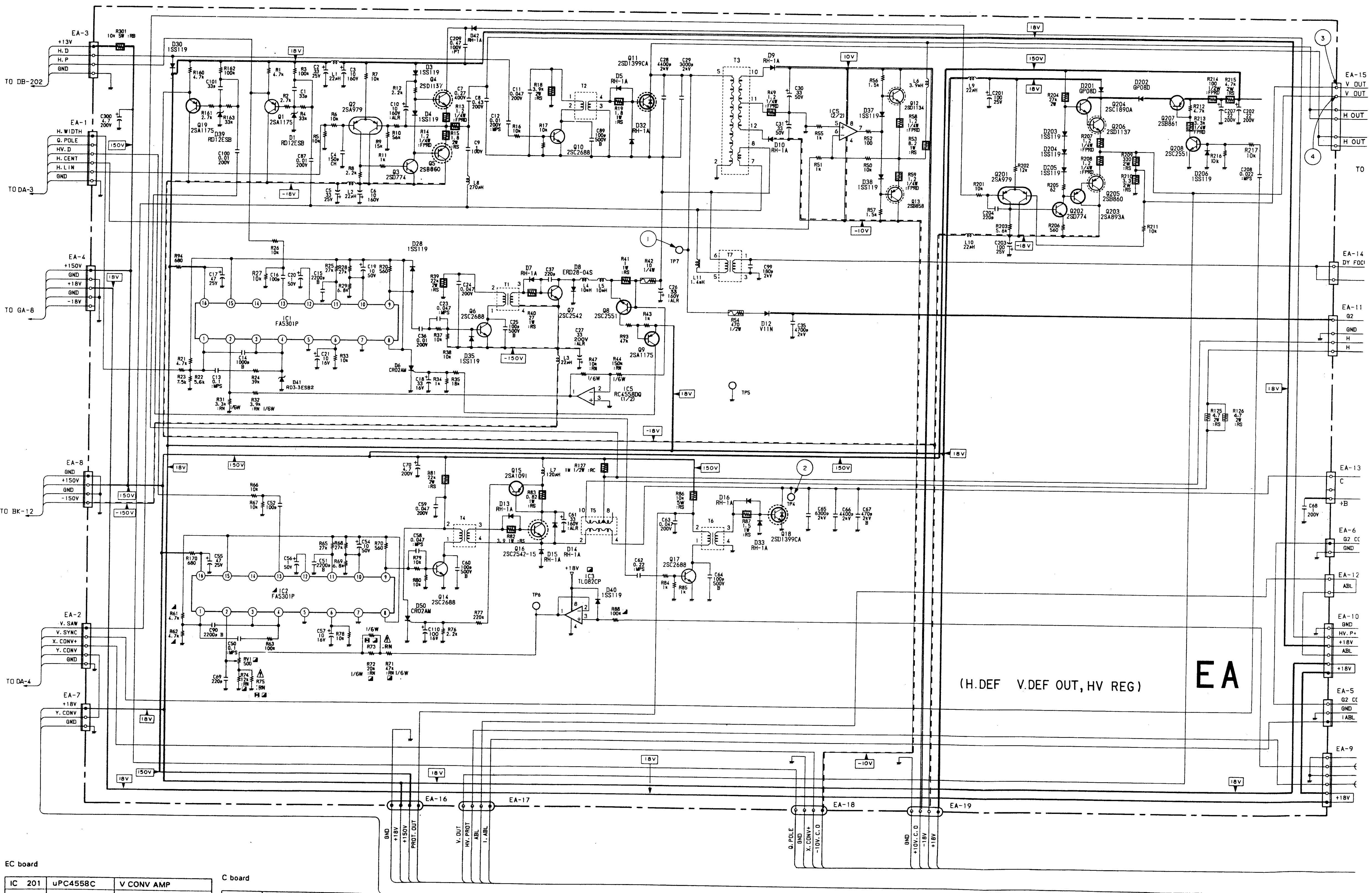
EA board (H.DEF & V.DEF OUT, HV REG)
EB board (H.V , BEAM CURRENT & CRT PROTECTOR)
EC board (V CONVERGENCE OUT)
C board (CRT SOCKET)
P board (FBT)

EA board

IC	1	FA5301P	P.W.M CONTROL
	2	FA5301P	P.W.M CONTROL
	3	TL082CP	BUFF/COMPARATOR
	5	uPC4558C	H.CENT
Q	1	2SA1175	AFC PULSE
	2	2SA979	H.LIN AMP
	3	2SD774	H.LIN AMP
	4	2SD1137	H.LIN AMP
	5	2SB860	H.LIN AMP
	6	2SC2688	P.W.M DRIVE
	7	2SC2542	P.W.M OUT
	8	2SC2551	O.C.P
	9	2SA1175	O.C.P
	10	2SC2688	H.DRIVE
	11	2SD1399	H.OUT
	12	2SD1134	H.CENT AMP
	13	2SB858	H.CENT AMP
	14	2SC2688	P.W.M
	15	2SA1091	O.C.P
	16	2SC2542	DC-DC CONVERTER
	17	2SC2688	HV DRIVE
	18	2SD1399	HV CONVERTER
	19	2SA1175	AFC.PULSE
	201	2SA979	V.OUT AMP
	202	2SD774	V.OUT AMP
	203	2SA893A	V.OUT AMP
	204	2SC1890A	V.OUT AMP
	205	2SB860	V.OUT AMP
	206	2SD1137	V.OUT AMP
	207	2SB861	RETRACE BOOST AMP
	208	2SC2551	RETRACE BOOST AMP
D	1	RD12ES-B2	BIAS
	3	1SS119	BIAS
	4	1SS119	BIAS
	5	RH-1A	H.DRIVE
	6	CR02AM-8	PROTECTOR
	7	RH-1A	DC.DC CONV
	8	ERD28-08S	DC.DC CONV
	9	RH-1A	H.P. RECT
	10	RH-1A	H.P. RECT
	12	V11N	RECT
	13	RH-1A	HV CONV
	14	RH-1A	DC-DC CONV
	15	RH-1A	DC-DC CONV
	16	RH-1A	HV CONV
	28	1SS119	PROTECTOR
	30	1SS119	PROTECTOR
	32	RH-1A	PROTECTOR
	33	RH-1A	PROTECTOR
	35	1SS119	PROTECTOR
	37	1SS119	BIAS
	38	1SS119	BIAS
	39	RD12ES-B2	BIAS
	40	1SS119	
	41	RD3.3ES-B2	
	42	RH-1A	
	50	CR02AM-8	PROTECTOR
	201	GP080	RETRACE BOOST SW
	202	GP080	RETRACE BOOST SW
	203	1SS119	BIAS
	204	1SS119	BIAS
	205	1SS119	BIAS
	206	1SS119	PROTECTOR

EB board

IC	4	LM2903DQ	HV PROT/BEAM CURRENT PROT1
	6	LM2903DQ	CRT PROT/BEAM CURRENT PROT2
Q	20	2SC2785	CRTPROT
D	19	1SS119	PROTECTOR
	20	1SS119	MIXER
	24	UPC574J	32V REG
	25	1SS119	MIXER
	26	1SS119	MIXER
	27	CR02AM-8	PROTECTOR
	29	UPC574J	32V REG
	36	1SS119	
	51	CR2AM-8	PROTECTOR

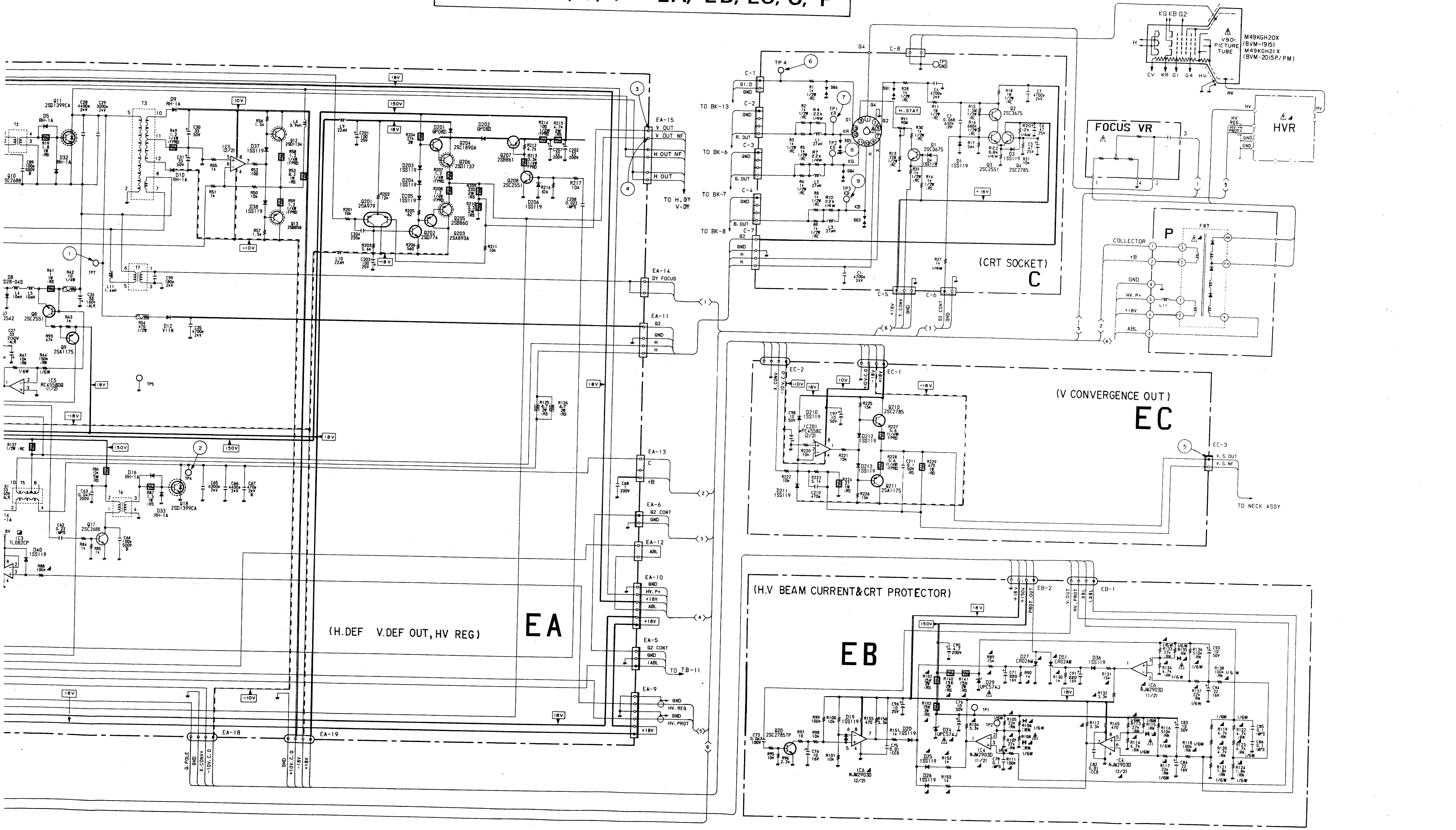

EA
(H.DEF V.DEF OUT, HV REG)
TO DB-202
TO DA-3
TO GA-8
TO BK-12
TO DA-4
EA-1
EA-2
EA-3
EA-4
EA-5
EA-6
EA-7
EA-8
EA-9
EA-10
EA-11
EA-12
EA-13
EA-14
EA-15
EA-16
EA-17
EA-18
EA-19
IC1 FA5301P
IC2 FA5301P
IC3 TL082CP
IC5 RC4558DQ (1/2)
T1
T3
T4
T5
T6
T7
18V
150V
-150V
-18V
10V
-10V
GND
+18V
+150V
PROT. OUT
V. OUT
HV. PROT
I. ABL
Q. POLE
X. CONV+
-10V.C.O
+10V.C.O
V OUT
H OUT
DY FOCUS
G2
ABL
H. WIDTH
H. CENT
H. LIN
V. SAW
V. SYNC
X. CONV+
Y. CONV

EC board

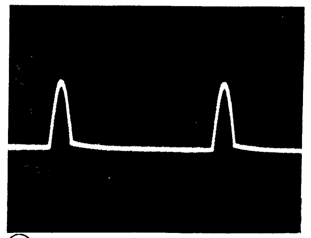
IC	201	uPC4558C	V CONV AMP
Q	210	2SC2785	V CONV AMP
	211	2SA1175	V CONV AMP
D	210	1SS119	PROTECTOR
	211	1SS119	PROTECTOR
	212	1SS119	BIAS
	213	1SS119	BIAS

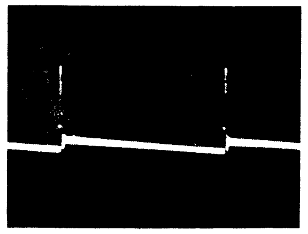
C board

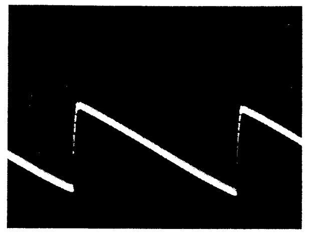
Q	1	2SC3675	V.CON DRIVE
	2	2SC3675	G2 CONT
	3	2SC2551	G2 CONT
	4	2SC2785	G2 CONT
D	1	1SS119	PROTECTOR
	3	1SS119	PROTECTOR
	4	1SS119	PROTECTOR

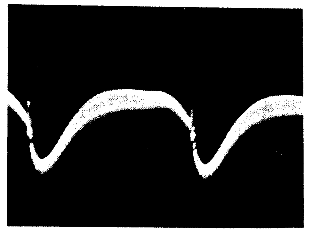

EA
(H.DEF V.DEF OUT, HV REG)
EB
(H.V BEAM CURRENT&CRT PROTECTOR)
EC
(V CONVERGENCE OUT)
C
(CRT SOCKET)
P
FBT
FOCUS VR
HVR
V901 PICTURE TUBE
M49KGH20X (BVM-1915)
M49KGH21X (BVM-2015P/PM)
TO H.DY V.DY
TO NECK ASSY
TO TB-11
TO BK-13
TO BK-6
TO BK-7
TO BK-8
EA-15
EA-14
EA-11
EA-13
EA-6
EA-12
EA-10
EA-5
EA-9
EA-18
EA-19
EB-1
EB-2
EC-1
EC-2
EC-3
C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
V OUT
V OUT NF
H OUT NF
H OUT
DY FOCUS
G2 CONT
ABL
HV.P+
+18V
HV.REG
HV.PROT
V.S.OUT
V.S.NF
COLLECTOR
+B
GND
150V
18V
10V
-10V
-18V
IC5
IC201
IC4
IC6
NJM2903D
µPC574J
TP1
TP2
TP3
TP4
TP5
TP7

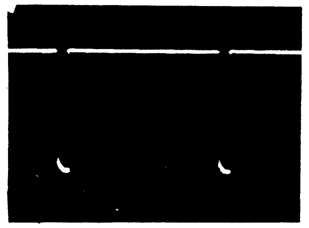
EA board (H.DEF & V DEF OUT, HV.REG)

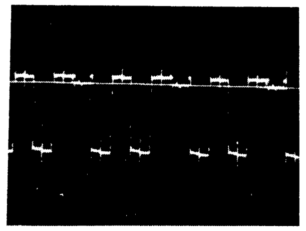

① 760Vp-p (H)
② 840Vp-p (H)

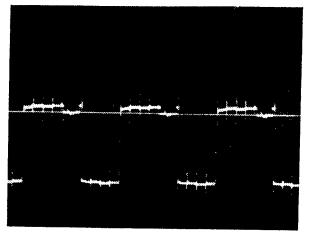

③ 110 Vp-p (V)

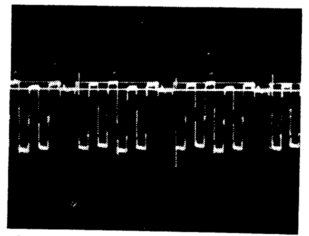

④ 3.6Vp-p (V)


⑤ 0.5Vp-p (V)

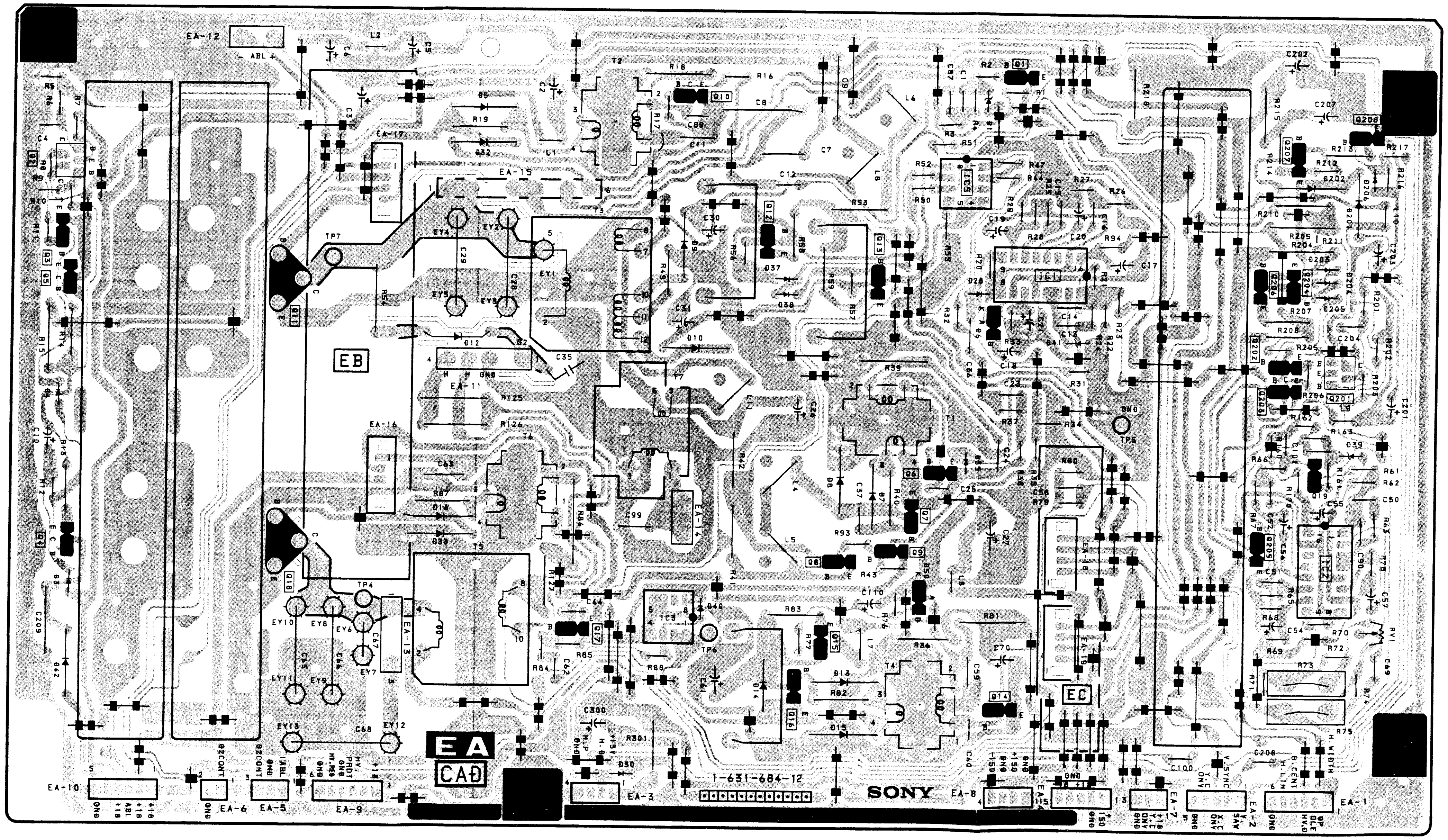

⑥ 124Vp-p (H)

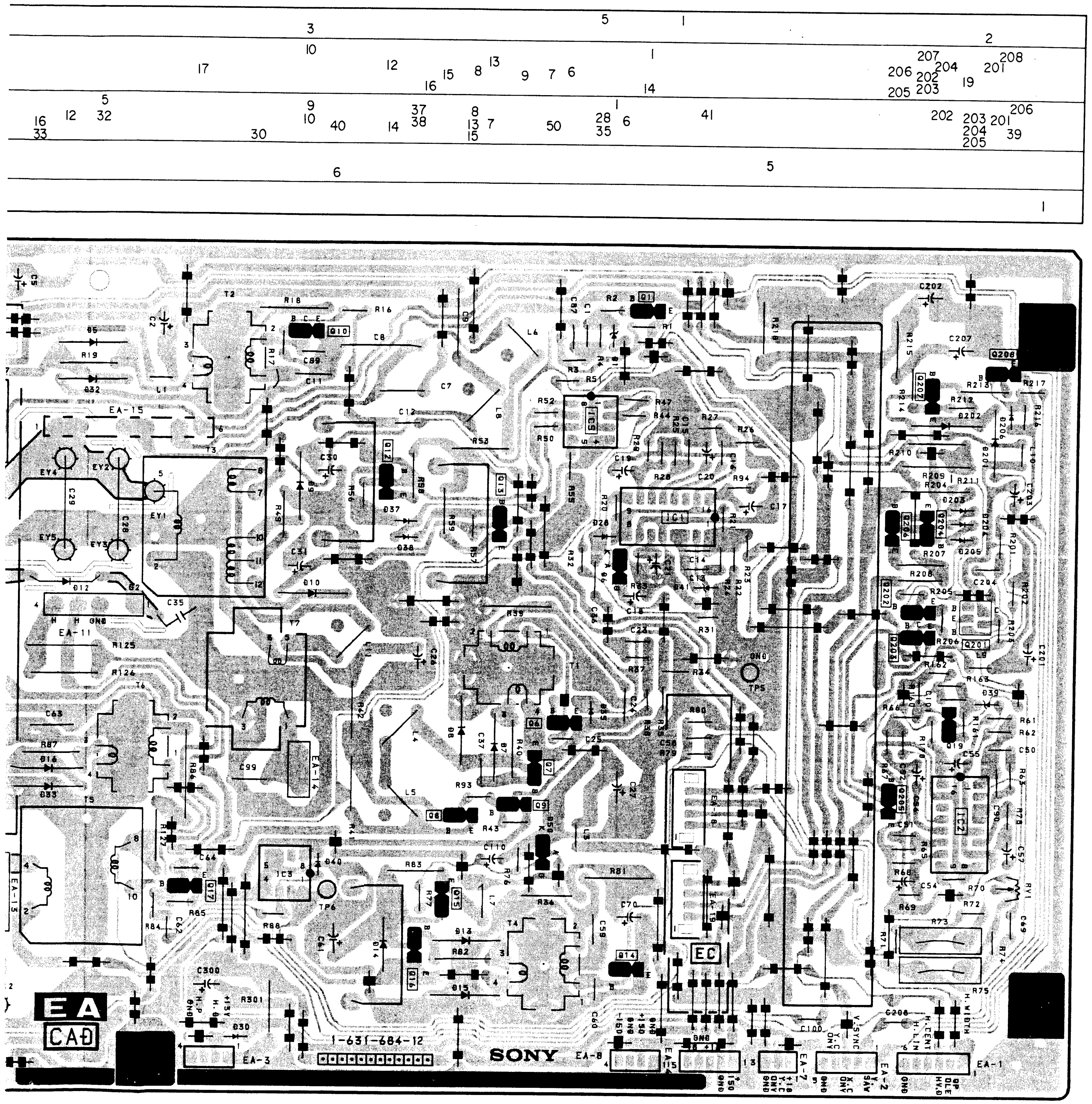

⑦ 60Vp-p (H)


⑧ 76Vp-p (H)

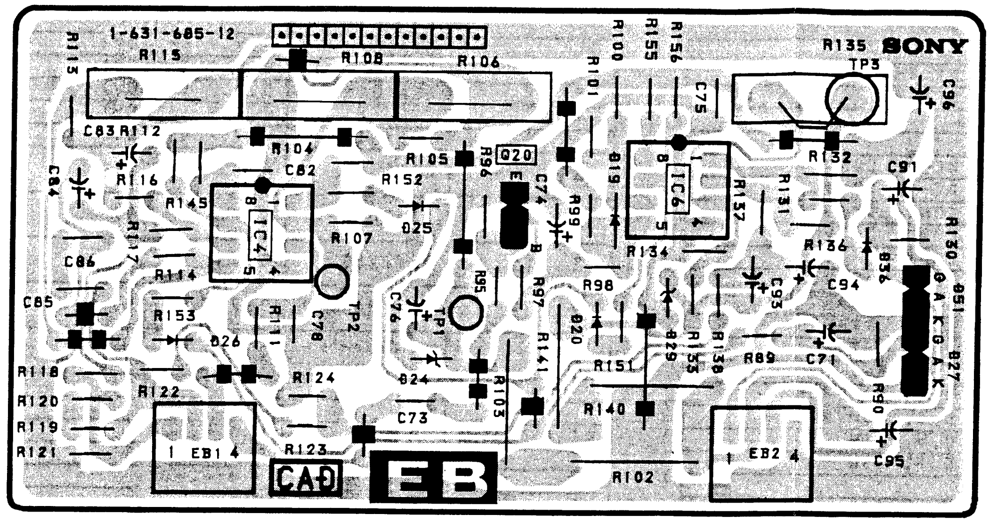

⑨ 54Vp-p (H)

IC	3 5 1
Q	2 3 5 4 11 18 17 10 12 16 15 8 13 9 7 6 1 14 206 205 207 202 203 204 19 201 208 2
D	4 3 42 16 33 12 5 32 30 9 10 40 14 37 38 8 13 15 7 50 28 35 1 6 41 202 203 204 205 201 206 39
TP	7 4 6 5
RV	1

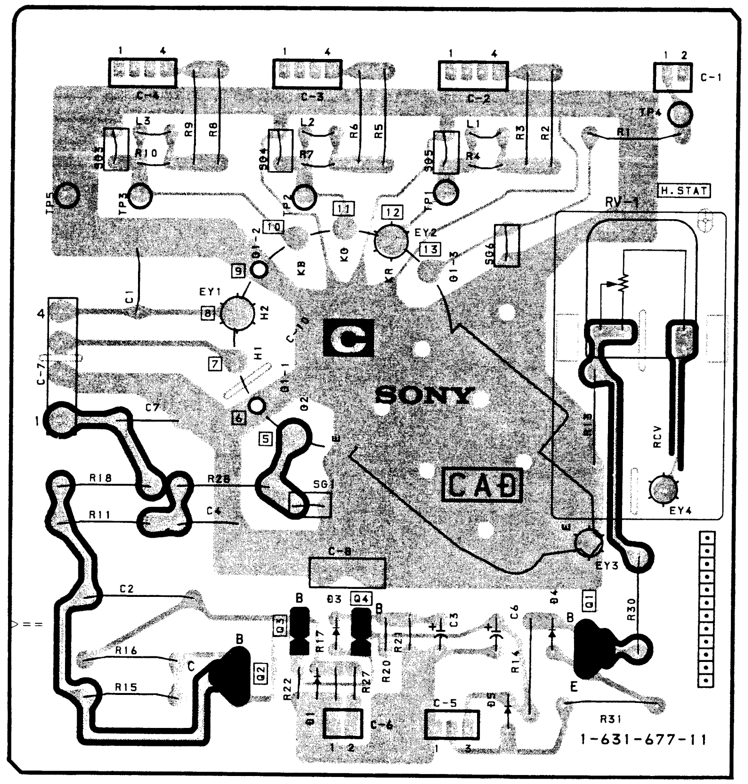

EA
CAD
EB
EC
SONY
1-631-684-12
EA-1
EA-2
EA-3
EA-5
EA-6
EA-7
EA-8
EA-9
EA-10
EA-11
EA-12
EA-13
EA-14
EA-15
EA-16
EA-17
TP4
TP5
TP6
TP7
T1
T2
T4
T5
IC1
IC2
IC3
EY1
EY2
EY3
EY4
EY5
EY6
EY7
EY8
EY9
EY10
EY11
EY12
EY13
RY1


EA
CAD
1-631-684-12
SONY
EA-1
EA-2
EA-3
EA-7
EA-8
EA-11
EA-13
EA-14
EA-15
IC1
IC2
IC3
IC5
TP5
TP6
EC

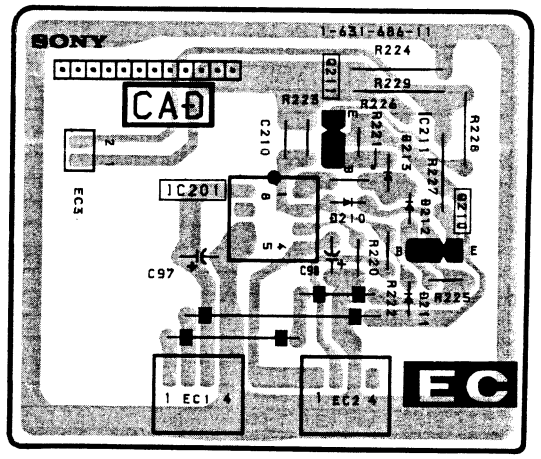
EB board (H.V, BEAM CURRENT & CRT PROTECTOR)


1-631-685-12
SONY
EB
CAD
IC4
IC6
TP1
TP2
TP3
EB1
EB2

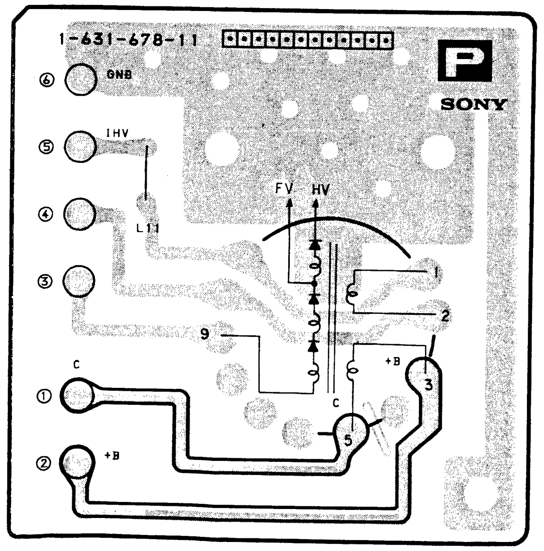
C board (CRT SOCKET)


C
SONY
CAD
1-631-677-11
C-1
C-2
C-3
C-4
C-5
C-6
C-7
C-8
H.STAT
RV-1
EY1
EY2
EY3
EY4
TP4
TP5

EC board (V CONVERGENCE OUT)


SONY
1-631-686-11
CAD
IC201
EC
EC1
EC2
EC3

P board (FBT)


1-631-678-11
P
SONY
⑥ GND
⑤ IHV
④
③
① C
② +B
FV
HV
L11
9
1
2
3
5
C
+B

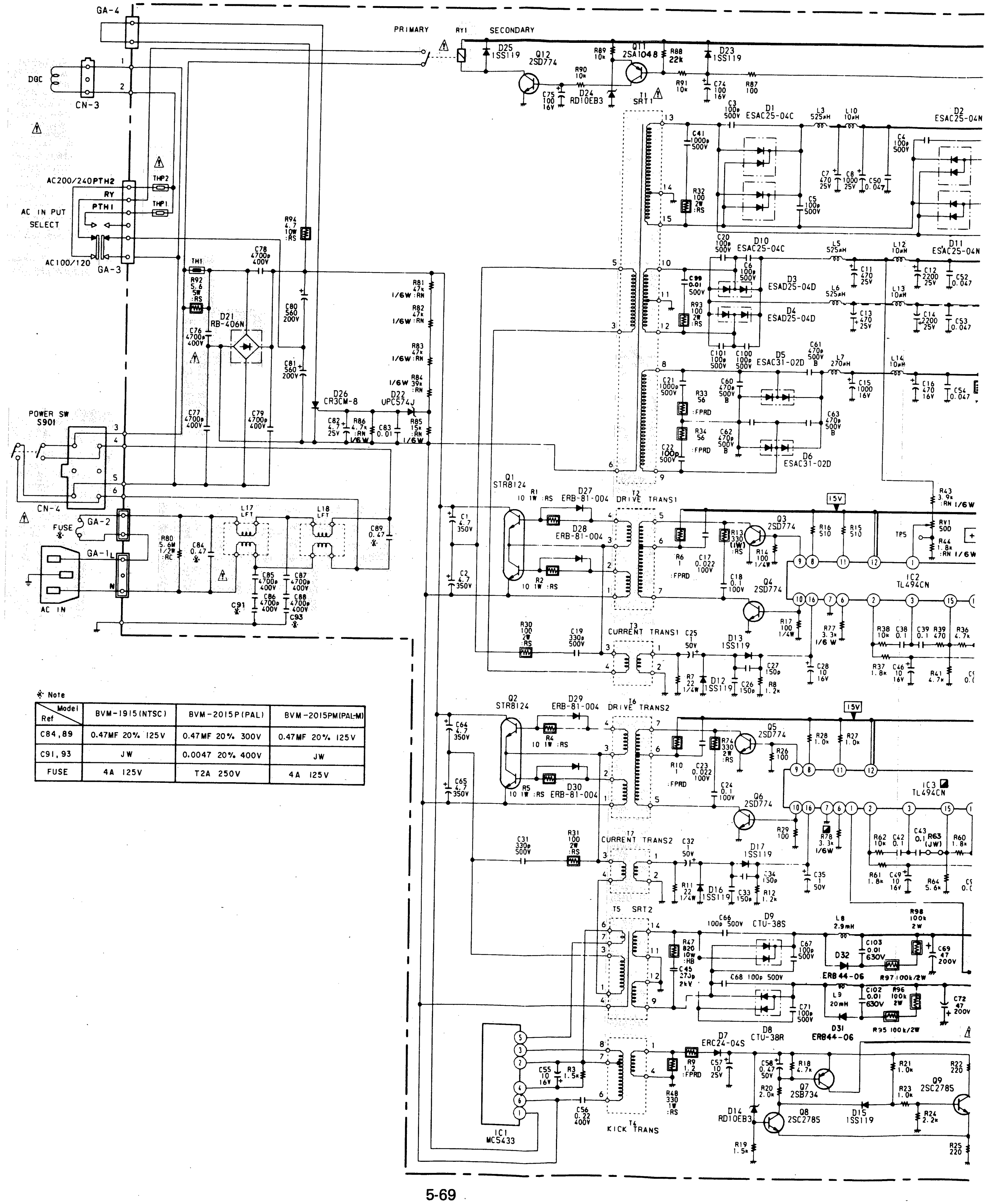
GA BOARD

IC1	MC5433	STARTER
2	TL494CN	DC REG
3	TL494CN	DC REG
Q1	STR8124	DC-DC CONV.
2	STR8124	DC-DC CONV.
3	2SD774	CONV. DRIVE
4	2SD774	CONV. DRIVE
5	2SD774	CONV. DRIVE
6	2SD774	CONV. DRIVE
7	2SB734	SOFT. START
8	2SC2785	SOFT. START
9	2SC2785	SOFT. START
10	2SD1134	+5V REG.
11	2SA1048	D.G. CONTROL
12	2SD774	D.G. CONTROL
13	2SC2785	O.V.P SW
14	2SC2785	O.V.P SW
D1	ESAC25-04C	+18V RECT
2	ESAC25-04N	-18V RECT
3	ESAD25-04D	+15V RECT
4	ESAD25-04D	-15V RECT
5	ESAC31-02D	+5V RECT
6	ESAC31-02D	-5V RECT
7	ERC24-045	START. RECT
8	CTU-38R	-150V RECT
9	CTU-38S	+150V RECT
10	ESAC25-04C	+18V RECT
11	ESAC25-04N	-18V RECT
12	1SS119	O.C.P RECT
13	1SS119	O.C.P RECT
14	RD10EB3T	STARTER
15	1SS119	STARTER
16	1SS119	O.C.P RECT
17	1SS119	O.C.P RECT
18	RD5.6E-B2TN	+5V REG
20	.SIB01-02	DC. STOPPER
21	R3406N	AC RECT
22	uPC574J	O.V.P
23	1SS119	DISCHARGE
24	RD10EB3T	+10V REG
25	1SS119	SW PROTECT
26	CR3CM-8	O.V.P
27	ERB81-004	CONV. DRIVE
28	ERB81-004	CONV. DRIVE
29	ERB81-004	CONV. DRIVE
30	ERB81-004	CONV. DRIVE
31	ERB44-06	
32	ERB44-06	

GB BOARD

Q1	2SA1048	O.V.P (-150V)
2	2SC2785	O.V.P (-150V)
3	2SA1048	O.V.P (+150V)
4	2SC2785	O.V.P (+150V)
5	2SA1048	O.V.P (+150V)
6	2SA1048	O.V.P ($^{+15}_{+18}$V)
7	2SA1048	O.V.P ($^{+15}_{+18}$V)
8	2SC2785	O.V.P ($^{+15}_{+18}$V)
9	2SA1048	O.V.P ($^{-15}_{-18}$V)
10	2SC2785	O.V.P ($^{-15}_{-18}$V)
D1	1SS119	PROTECTOR
2	RD8.2ES-T1B2	REFERENCE
3	1SS119	PROTECTOR
4	1SS119	MIX.
5	1SS119	MIX.
6	RD8.2ES-T1B2	REFERENCE
7	TLR124	O.V.P INDICATE
8	1SS119	PROTECTOR
9	1SS119	PROTECTOR
10	TLR124	O.V.P INDICATE
11	RD8.2ES-T1B2	REFERENCE
12	1SS119	MIX.
13	1SS119	MIX.
14	1SS119	MIX.
15	1SS119	PROTECTOR
16	1SS119	PROTECTOR
17	RD8.2ES-T1B2	REFERENCE
18	1SS119	MIX.
19	1SS119	MIX.

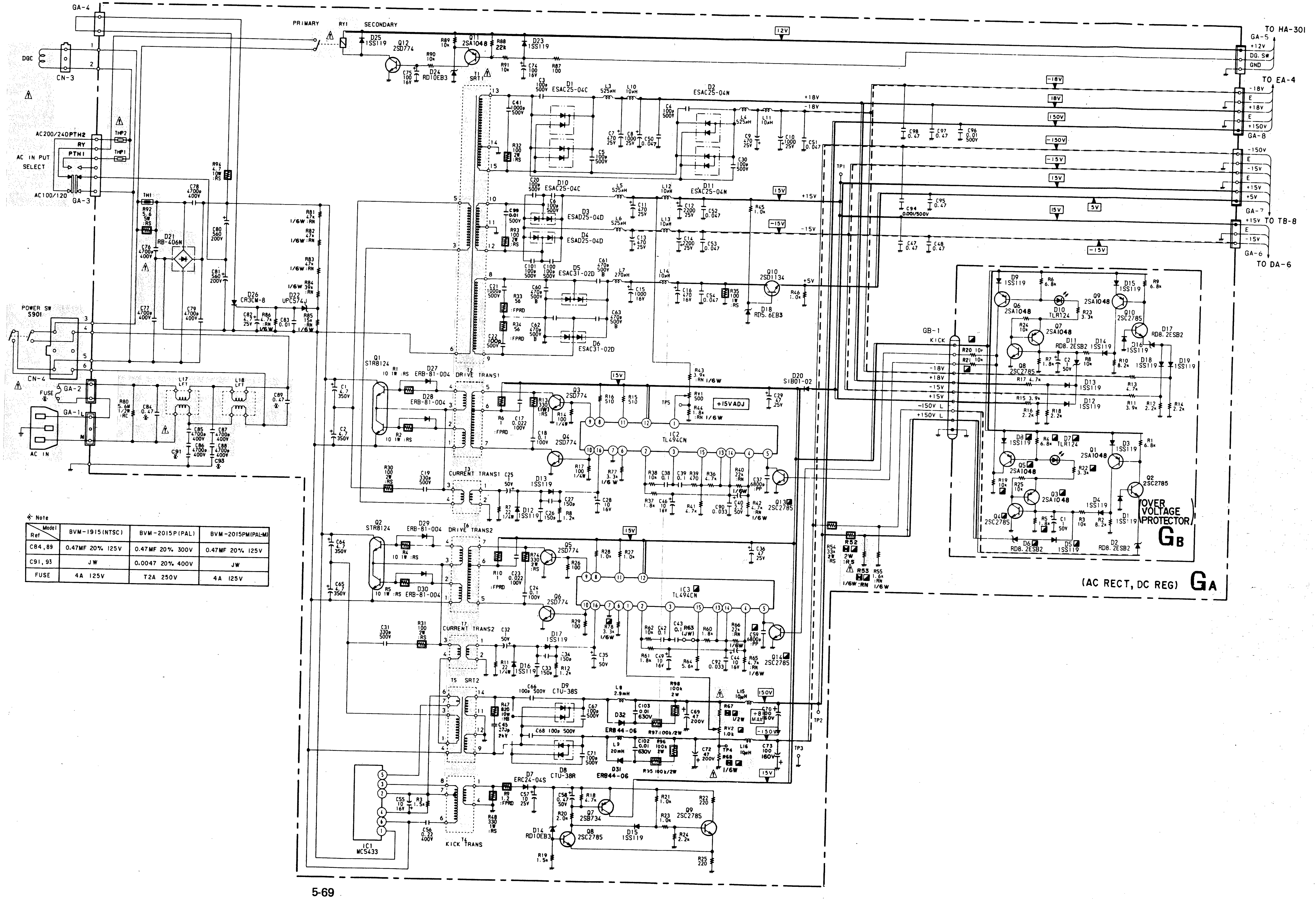
GA board (AC RECT, DC REG)
GB board (OVER VOLTAGE PROTECTOR)


GA-4
DGC
CN-3
AC200/240 PTH2
RY
PTH1
AC IN PUT SELECT
AC100/120
GA-3
THP2
THP1
TH1
R92 5.6 5W :RS
D21 RB-406N
C76 4700p 400V
C78 4700p 400V
C80 560 200V
C81 560 200V
C77 4700p 400V
C79 4700p 400V
R94 4.7 10W :RS
D26 CR3CM-8
D22 UPC574J
R81 47k 1/6W :RN
R82 47k 1/6W :RN
R83 47k 1/6W :RN
R84 39k 1/6W :RN
R85 15k 1/6W :RN
C82 4.7 25V
R86 4.7k :RN
C83 0.01
POWER SW S901
CN-4
FUSE
GA-2
GA-1
AC IN
R80 5.6M 1/2W :RC
C84 0.47
L17 LFT
L18 LFT
C85 4700p 400V
C86 4700p 400V
C87 4700p 400V
C88 4700p 400V
C89 0.47
C91
C93
PRIMARY
RY1
SECONDARY
D25 1SS119
Q12 2SD774
Q11 2SA1048
R89 10k
R88 22k
D23 1SS119
R90 10k
D24 RD10EB3
C75 100 16V
T1 SRT1
R91 10k
C74 100 16V
R87 100
C3 100p 500V
D1 ESAC25-04C
L3 525μH
L10 10μH
D2 ESAC25-04N
C41 1000p 500V
C4 100p 500V
R32 100 2W :RS
C7 470 25V
C8 1000 25V
C50 0.047
C5 100p 500V
C20 100p 500V
D10 ESAC25-04C
L5 525μH
L12 10μH
D11 ESAC25-04N
C99 0.01 500V
C6 100p 500V
D3 ESAD25-04D
L6 525μH
C11 470 25V
C12 2200 25V
C52 0.047
R93 100 2W :RS
D4 ESAD25-04D
C13 470 25V
L13 10μH
C14 2200 25V
C53 0.047
C101 100p 500V
C100 100p 500V
D5 ESAC31-02D
C61 470p 500V
L7 270μH
L14 10μH
C21 1000p 500V
C60 470p 500V
R33 56 :FPRD
C15 1000 16V
C16 470 16V
C54 0.047
C63 470p 500V
R34 56 :FPRD
C62 470p 500V
C22 100p 500V
D6 ESAC31-02D
Q1 STR8124
R1 10 1W :RS
D27 ERB-81-004
DRIVE TRANS1
15V
R43 3.9k :RN 1/6W
C1 4.7 350V
D28 ERB-81-004
R13 330 2W :RS
Q3 2SD774
R16 510
R15 510
RV1 500
TP5
R44 1.8k :RN 1/6W
R6 1 :FPRD
C17 0.022 100V
R14 100 1/4W
C2 4.7 350V
R2 10 1W :RS
C18 0.1 100V
Q4 2SD774
IC2 TL494CN
R17 100 1/4W
R77 3.3k 1/6 W
R38 10k
C38 0.1
C39 0.1
R39 470
R40 4.7k
R30 100 2W :RS
C19 330p 500V
T3 CURRENT TRANS1
C25 50V
D13 1SS119
C27 150p
C28 10 16V
R37 1.8k
C46 10 16V
R41 4.7k
R7 22 1/4W
D12 1SS119
C26 150p
R8 1.2k
Q2 STR8124
D29 ERB-81-004
T6 DRIVE TRANS2
C64 4.7 350V
R4 10 1W :RS
R74 330 2W :RS
Q5 2SD774
R28 1.0k
R27 1.0k
R26 100
R10 1 :FPRD
C23 0.022 100V
C24 0.1 100V
IC3 TL494CN
C65 4.7 350V
R5 10 1W :RS
D30 ERB-81-004
Q6 2SD774
R29 100
R78 3.3k 1/6W
R62 10k
C42 0.1
C43 0.1
R63 (JW)
R60 1.8k
C31 330p 500V
R31 100 2W :RS
T7 CURRENT TRANS2
C32 50V
D17 1SS119
C35 50V
R61 1.8k
C49 10 16V
R64 5.6k
R11 22 1/4W
D16 1SS119
C33 150p
R12 1.2k
C34 150p
T5 SRT2
C66 100p 500V
D9 CTU-38S
L8 2.9mH
R98 100k 2W
R47 820 10W :HB
C67 100p 500V
C103 0.01 630V
D32
C69 47 200V
C45 27p 2kV
C68 100p 500V
ERB44-06
R97 100k/2W
L9 20mH
C102 0.01 630V
R96 100k 2W
C72 47 200V
C71 100p 500V
D8 CTU-38R
D31 ERB44-06
R95 100k/2W
D7 ERC24-04S
C57 10 25V
R9 1.2 :FPRD
C58 0.47 50V
R18 4.7k
R21 1.0k
R22 220
C55 10 16V
R3 1.5k
R48 330 1W :RS
R20 2.0k
Q7 2SB734
Q9 2SC2785
R23 1.0k
C56 0.22 400V
T4 KICK TRANS
D14 RD10EB3
Q8 2SC2785
D15 1SS119
R24 2.2k
IC1 MC5433
R19 1.5k
R25 220

※ Note

Ref \ Model	BVM-1915(NTSC)	BVM-2015P(PAL)	BVM-2015PM(PAL-M)
C84,89	0.47MF 20% 125V	0.47MF 20% 300V	0.47MF 20% 125V
C91, 93	JW	0.0047 20% 400V	JW
FUSE	4A 125V	T2A 250V	4A 125V

GA board (AC RECT, DC REG)
GB board (OVER VOLTAGE PROTECTOR)

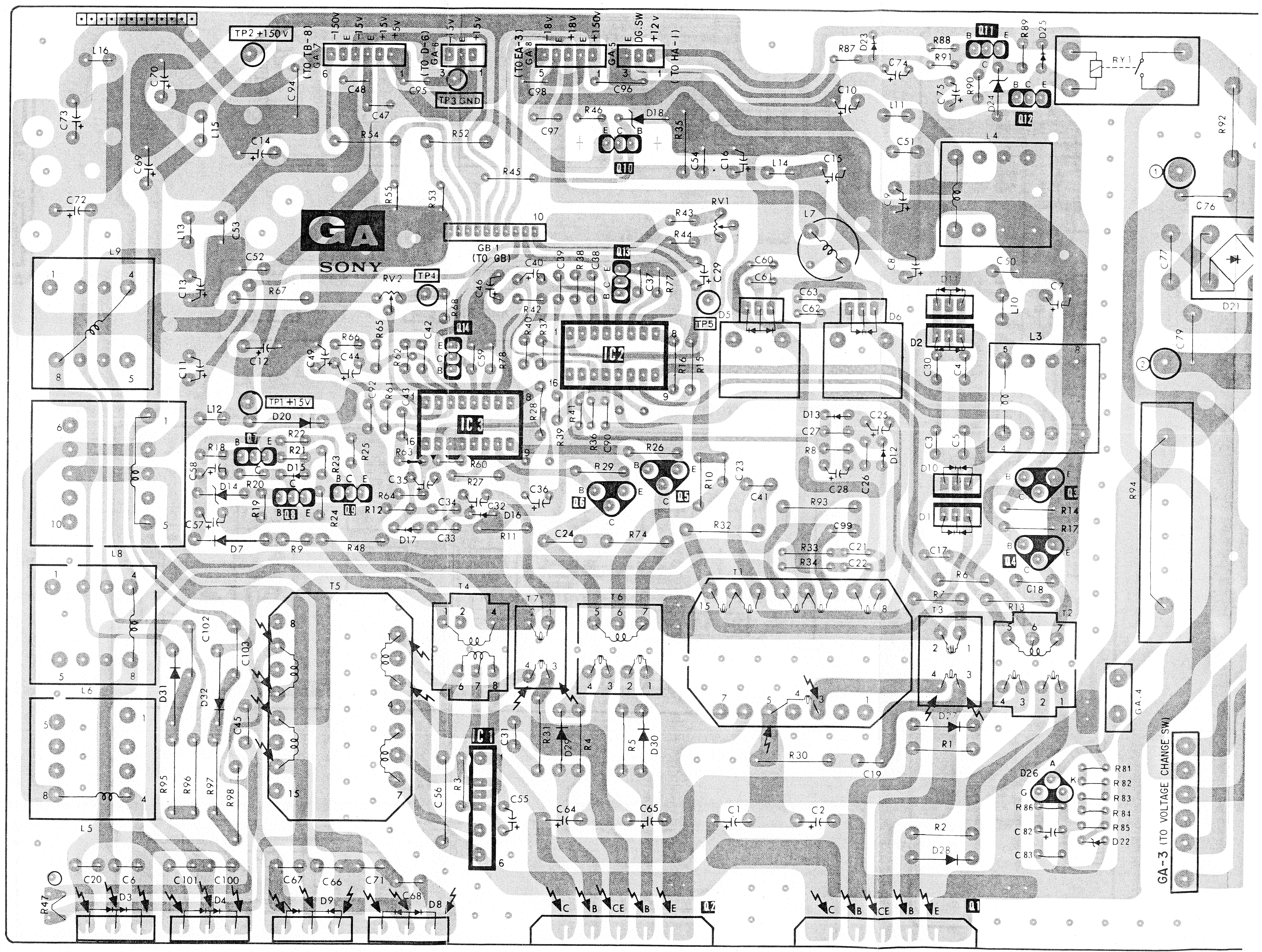

GA-4
DGC
CN-3
AC200/240PTH2
RY
PTH1
AC IN PUT SELECT
AC100/120
GA-3
THP2
THP1
TH1
D21 RB-406N
POWER SW S901
CN-4
FUSE
GA-2
GA-1
AC IN
PRIMARY
RY1
SECONDARY
Q12 2SD774
Q11 2SA1048
T1 SRT1
D1 ESAC25-04C
D2 ESAC25-04N
D10 ESAC25-04C
D11 ESAC25-04N
D3 ESAC25-04D
D4 ESAC25-04D
D5 ESAC31-02D
D6 ESAC31-02D
Q10 2SD1134
D18 RD5.6EB3
Q1 STR8124
D27 ERB-81-004
D28 ERB-81-004
T2 DRIVE TRANS1
T3 CURRENT TRANS1
Q3 2SD774
Q4 2SD774
IC2 TL494CN
+15VADJ
D20 S1B01-02
Q13 2SC2785
Q2 STR8124
D29 ERB-81-004
D30 ERB-81-004
T6 DRIVE TRANS2
T7 CURRENT TRANS2
Q5 2SD774
Q6 2SD774
IC3 TL494CN
Q14 2SC2785
T5 SRT2
D9 CTU-38S
D8 CTU-38R
D32 ERB44-06
D31 ERB44-06
D7 ERC24-04S
T4 KICK TRANS
IC1 MC5433
Q7 2SB734
Q8 2SC2785
Q9 2SC2785
D14 RD10EB3
D15 1SS119
TP1
TP2
TP3
TP5
12V
-18V
18V
150V
-150V
-15V
15V
5V
TO HA-301
GA-5
+12V
DG. SW
GND
TO EA-4
GA-8
GA-7
TO TB-8
GA-6
TO DA-6
GB-1
KICK
OVER VOLTAGE PROTECTOR
GB
(AC RECT, DC REG)
GA

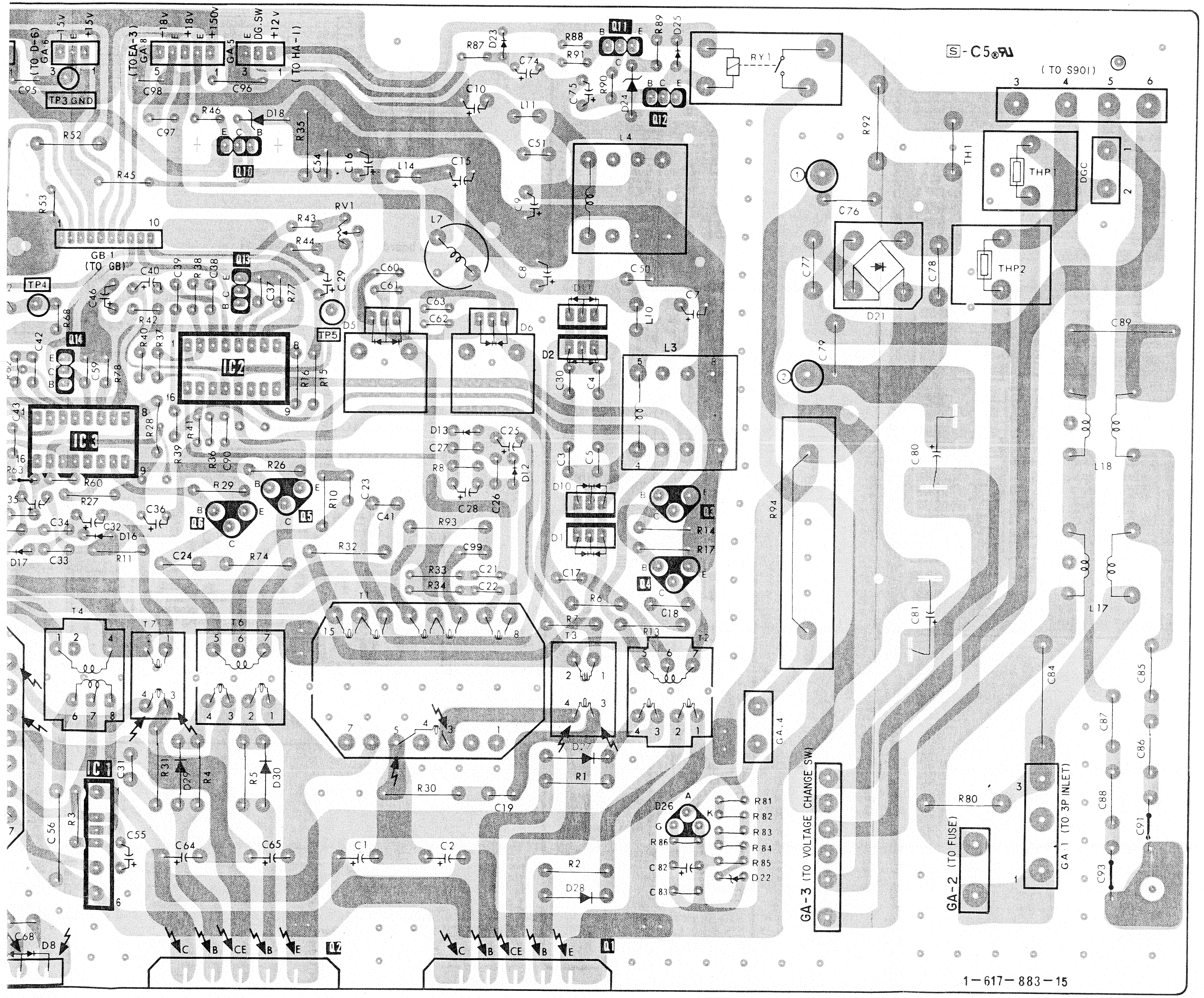
※ Note

Model / Ref	BVM-1915(NTSC)	BVM-2015P(PAL)	BVM-2015PM(PAL-M)
C84,89	0.47MF 20% 125V	0.47MF 20% 300V	0.47MF 20% 125V
C91, 93	JW	0.0047 20% 400V	JW
FUSE	4A 125V	T2A 250V	4A 125V

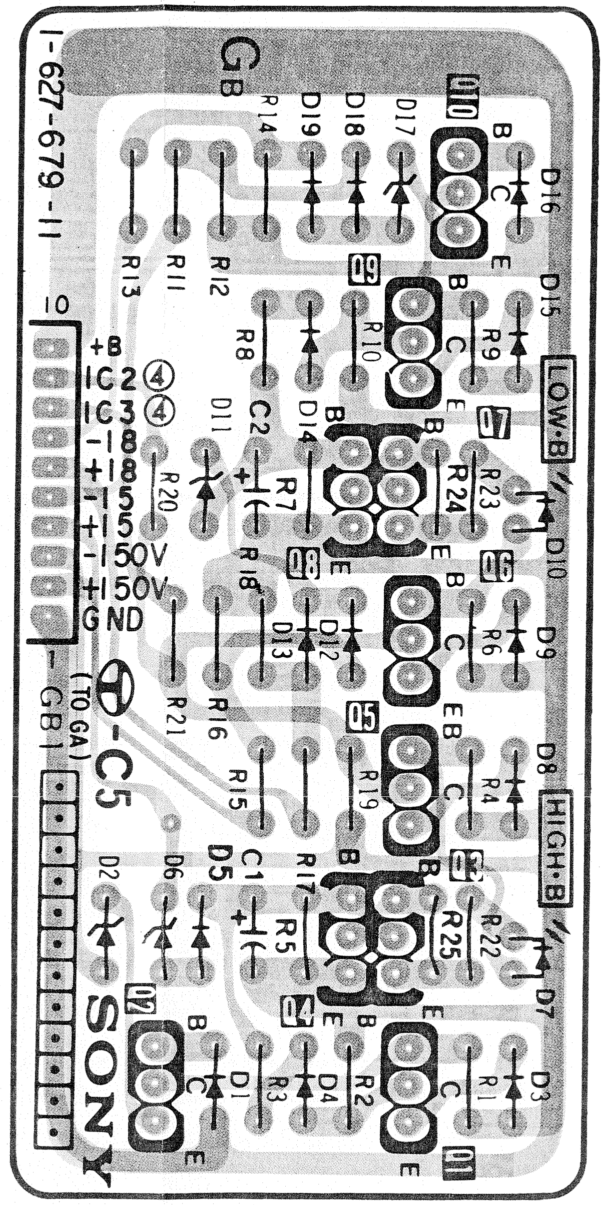
GA board (AC RECT, DC REG)

IC	Q	D	ADJ·TP
		23 25	
	11		
			TP2
		24	TP3
	12		
		18	
	10		
			RV1
		21	
		11	RV2 TP4 TP5
	13		
		5 6	
		2	
2			
	14		
			TP1
3			
		20 13	
	7		
		12	
	5	15	
	9 6 3	10	
	8	14	
		16	
		1	
		17	
	4	7	
		31,32	
		29 30 27	
		26	
1			
		22	
		28	
		3 4	
	2 1	9 8	


TP2 +150V
(TO TB-8) GA 7
-150V
E
-15V
+15V
+5V
(TO D-6) GA 6
-5V
+5V
TP3 GND
(TO EA-3) GA 8
-18V
E
+18V
+150V
GA 5
E
DG.SW
+12V
(TO HA-1)
GA
SONY
GB 1 (TO GB)
TP4
TP5
TP1 +15V
RV1
RV2
IC1
IC2
IC3
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
Q11
Q12
Q13
Q14
L1
L3
L4
L5
L6
L7
L8
L9
L10
L11
L12
L13
L14
L15
L16
T1
T2
T3
T4
T5
T6
T7
RY1
C76
C77
C79
D21
D26
GA-4
GA-3 (TO VOLTAGE CHANGE SW)
R81
R82
R83
R84
R85
R86
D22
C82
C83
R94
R92
D1
D2
D3
D4
D8
D9
D10
D11
D27
D28
D29
D30
D31
D32
R47


(TO D-6) GA 6
(TO EA-3) GA 8
GA 5
(TO HA-1)
TP3 GND
TP4
TP5
GB 1 (TO GB)
IC1
IC2
IC3
RY1
RV1
T1
T2
T3
T4
T6
T7
L3
L4
L7
L10
L11
L14
L17
L18
TH1
THP1
THP2
DGC
D21
D26
S-C5
(TO S901)
GA 4
GA-3 (TO VOLTAGE CHANGE SW)
GA-2 (TO FUSE)
GA 1 (TO 3P INLET)
Q1
Q2
Q10
Q11
Q12
Q13
Q14
1-617-883-15

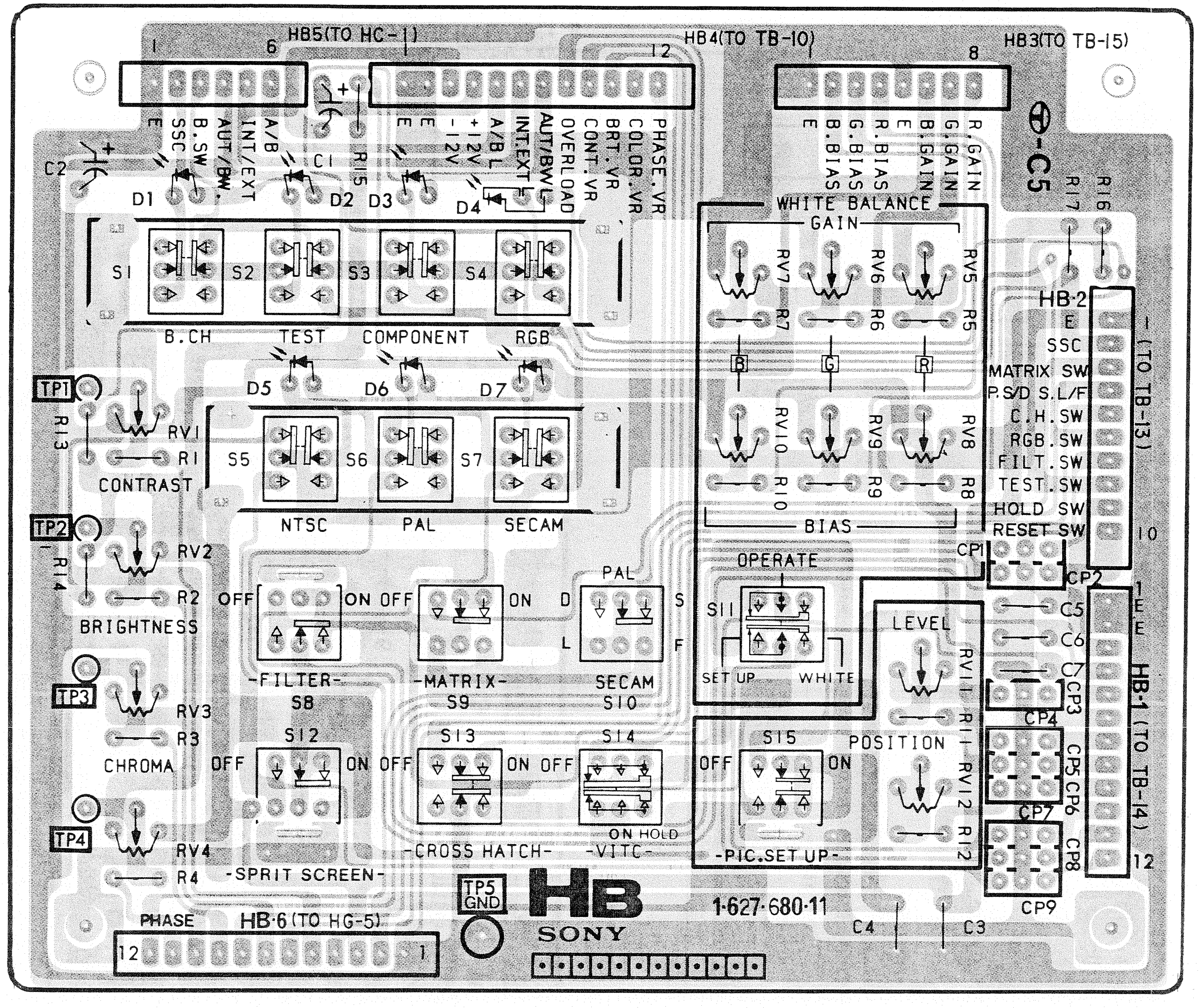
GB board (OVER VOLTAGE PROTECTOR)


GB
1-627-679-11
+B
IC2④
IC3④
-18
+18
-15
+15
-150V
+150V
GND
GB 1 (TO GA)
S-C5
SONY
LOW-B
HIGH-B
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10

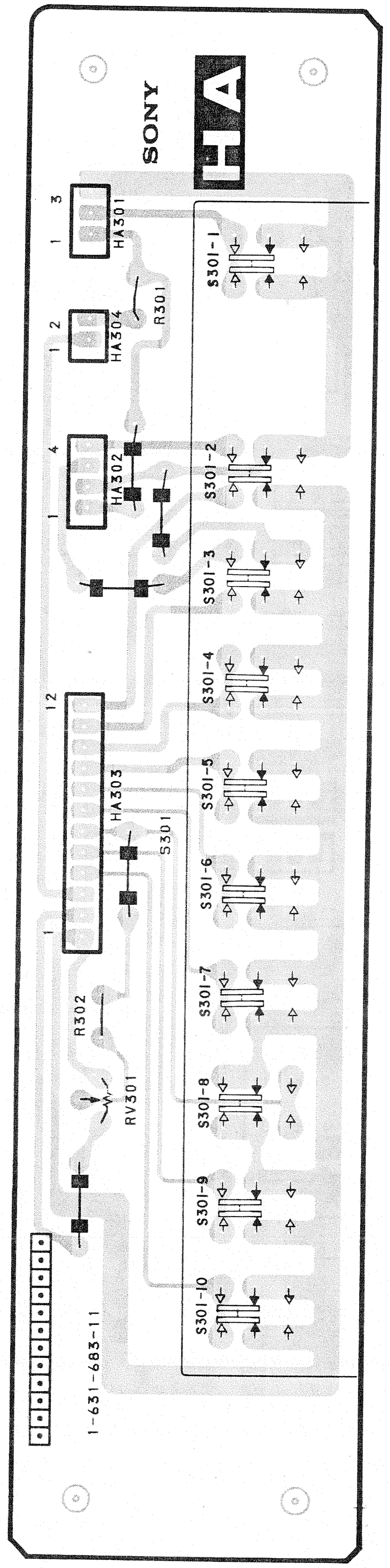
● ▨ : Conductor side pattern

● ▨ : Component side pattern

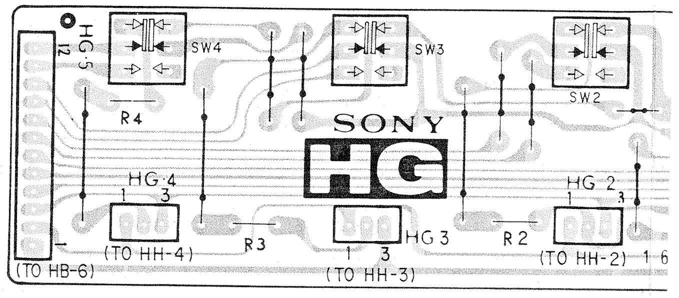
HB board (SYSTEM SWITCH)


HB5(TO HC-1)
HB4(TO TB-10)
HB3(TO TB-15)
E
SSC
B.SW
AUT/BW
INT/EXT
A/B
+12V
-12V
A/BL
INT.EXT
AUT/BWL
OVERLOAD
CONT.VR
BRT.VR
COLOR.VR
PHASE.VR
R.GAIN
G.GAIN
B.GAIN
R.BIAS
G.BIAS
B.BIAS
C2
C1
R15
D1
D2
D3
D4
S1
S2
S3
S4
B.CH
TEST
COMPONENT
RGB
D5
D6
D7
S5
S6
S7
NTSC
PAL
SECAM
TP1
TP2
TP3
TP4
R13
R14
RV1
R1
CONTRAST
RV2
R2
BRIGHTNESS
RV3
R3
CHROMA
RV4
R4
-SPRIT SCREEN-
OFF
ON
-FILTER-
S8
-MATRIX-
S9
D
L
S
F
SECAM
S10
S12
S13
S14
-CROSS HATCH-
-VITC-
ON HOLD
WHITE BALANCE
GAIN
RV5
RV6
RV7
R5
R6
R7
B
G
R
RV8
RV9
RV10
R8
R9
R10
BIAS
OPERATE
S11
SET UP
WHITE
LEVEL
RV11
R11
S15
POSITION
RV12
R12
-PIC.SET UP-
R16
R17
C5
HB-2
MATRIX SW
P.S/D S.L/F
C.H.SW
RGB.SW
FILT.SW
TEST.SW
HOLD SW
RESET SW
(TO TB-13)
HB-1 (TO TB-14)
CP1
CP2
CP3
CP4
CP5
CP6
CP7
CP8
CP9
C3
C4
C5
C6
C7
TP5 GND
HB
SONY
1-627-680-11
PHASE
HB-6 (TO HG-5)
1
6
8
10
12

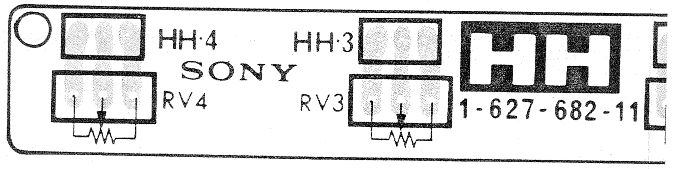
HA board (MANUAL CONTROL)


SONY
HA
HA301
HA304
HA302
HA303
R301
R302
RV301
S301
S301-1
S301-2
S301-3
S301-4
S301-5
S301-6
S301-7
S301-8
S301-9
S301-10
1-631-683-11
1
2
3
4
12

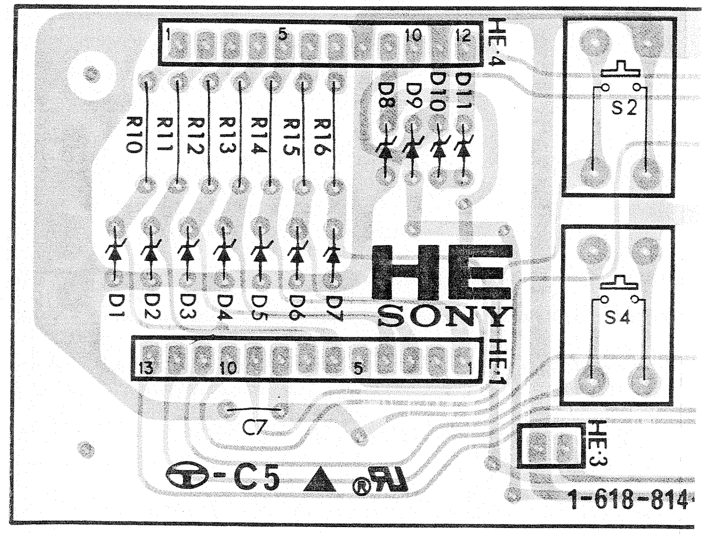
HG board (CONTROL PANEL 2)


HG-5
12
SW4
SW3
SW2
R4
SONY
HG
HG-4
HG-3
HG-2
R3
R2
(TO HB-6)
(TO HH-4)
(TO HH-3)
(TO HH-2)

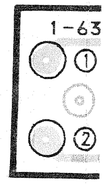
HH board (CONTROL PANEL 1)


HH-4
HH-3
SONY
HH
RV4
RV3
1-627-682-11

HE board (AUTO SET-UP CONTROL)

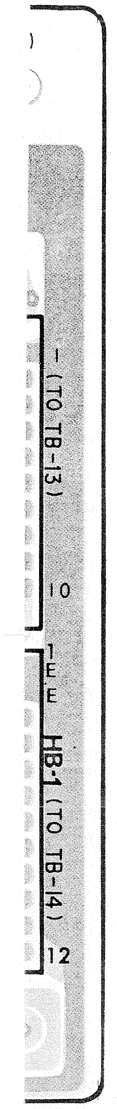

HE-4
HE-1
HE-3
S2
S4
R10
R11
R12
R13
R14
R15
R16
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
HE
SONY
C7
C5
1-618-814

XB board

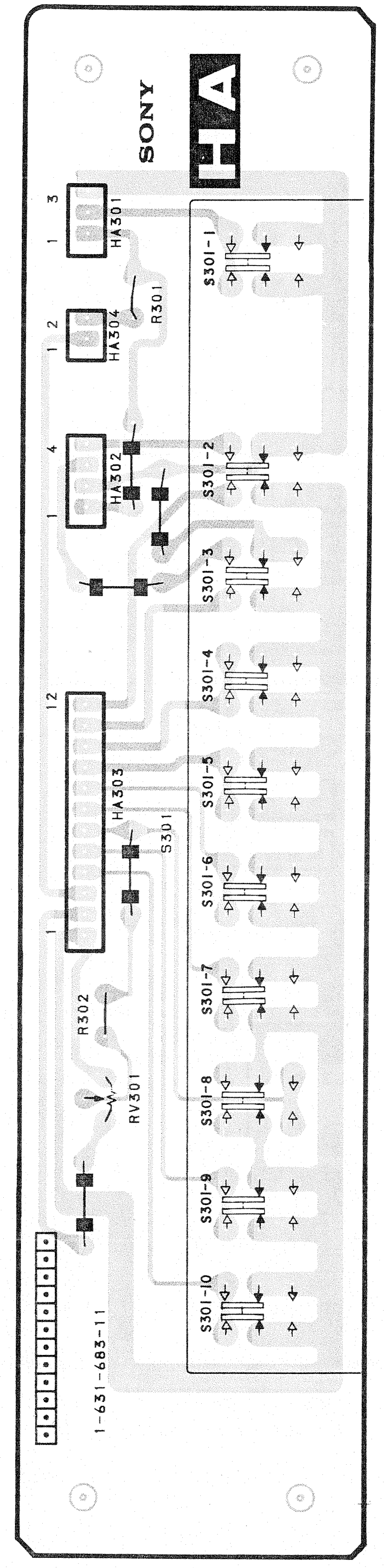


● ▨ : Conductor side pattern

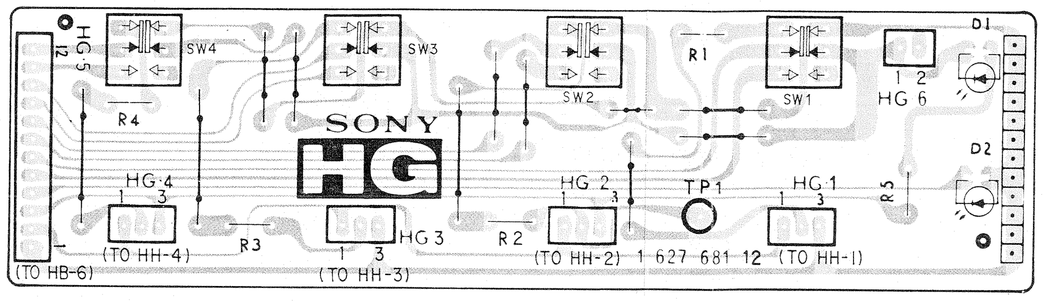
● ▨ : Component side pattern


(TO TB-13)
10
HB-1 (TO TB-14)
12

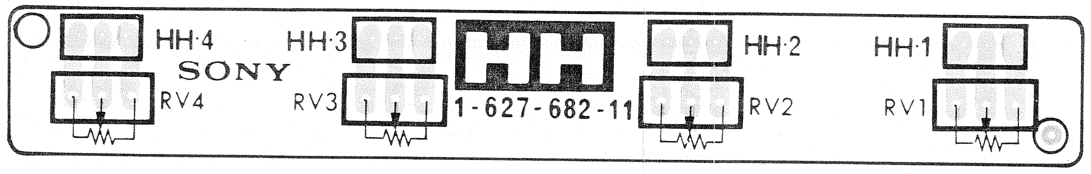
HA board (MANUAL CONTROL)


SONY
HA
HA301
HA304
R301
HA302
HA303
S301
S301-1
S301-2
S301-3
S301-4
S301-5
S301-6
S301-7
S301-8
S301-9
S301-10
R302
RV301
1-631-683-11

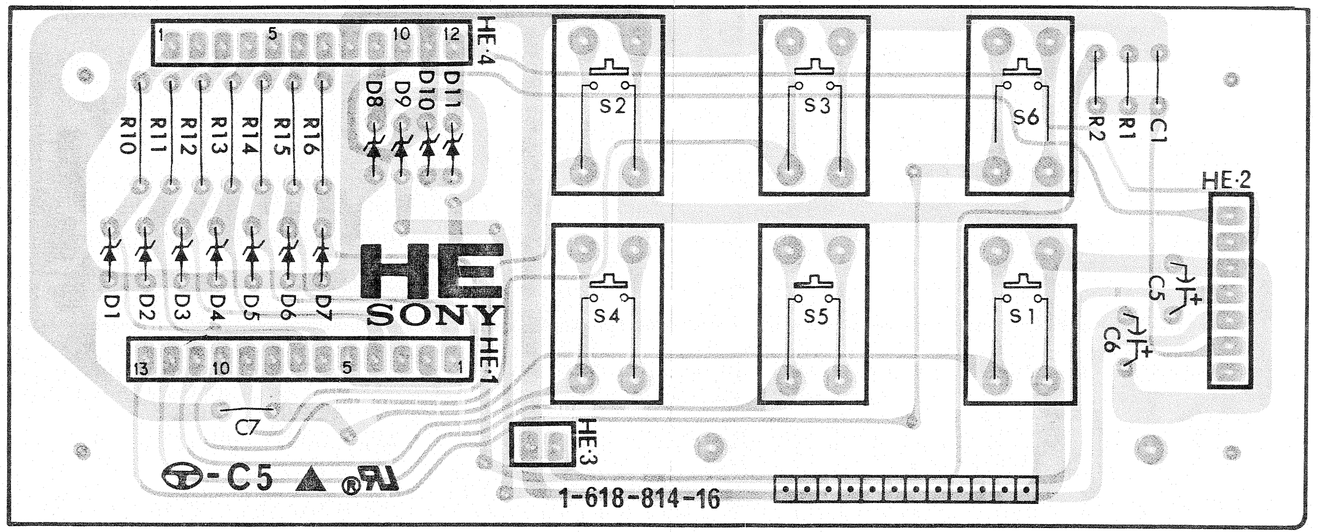
HG board (CONTROL PANEL 2)


HG 5
SW4
SW3
SW2
SW1
R1
D1
HG 6
R4
SONY
HG
D2
HG 4
HG 2
TP1
HG 1
R5
R3
HG 3
R2
(TO HH-4)
(TO HB-6)
(TO HH-3)
(TO HH-2)
1-627-681-12
(TO HH-1)

HH board (CONTROL PANEL 1)


HH 4
HH 3
HH
HH 2
HH 1
SONY
RV4
RV3
1-627-682-11
RV2
RV1

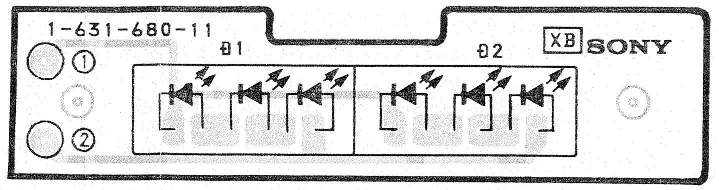
HE board (AUTO SET-UP CONTROL)


HE-4
S2
S3
S6
R2
R1
C1
R10
R11
R12
R13
R14
R15
R16
D8
D9
D10
D11
HE-2
HE
SONY
D1
D2
D3
D4
D5
D6
D7
HE-1
S4
S5
S1
C5
C6
C7
HE-3
C5
1-618-814-16

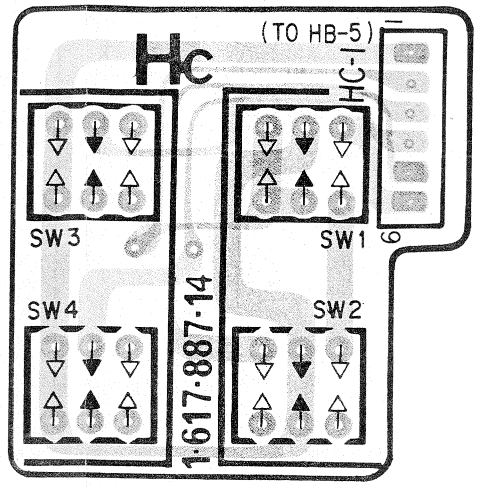
● ▨ : Conductor side pattern

● ▨ : Component side pattern

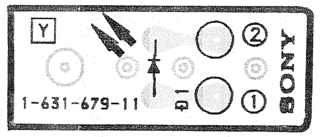
XB board (TALLY)


1-631-680-11
D1
D2
XB
SONY
①
②

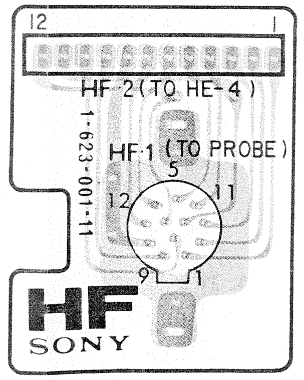
HC board (INPUT SELECT)


HC
(TO HB-5)
HC-1
SW3
SW1
SW4
SW2
1-617-887-14

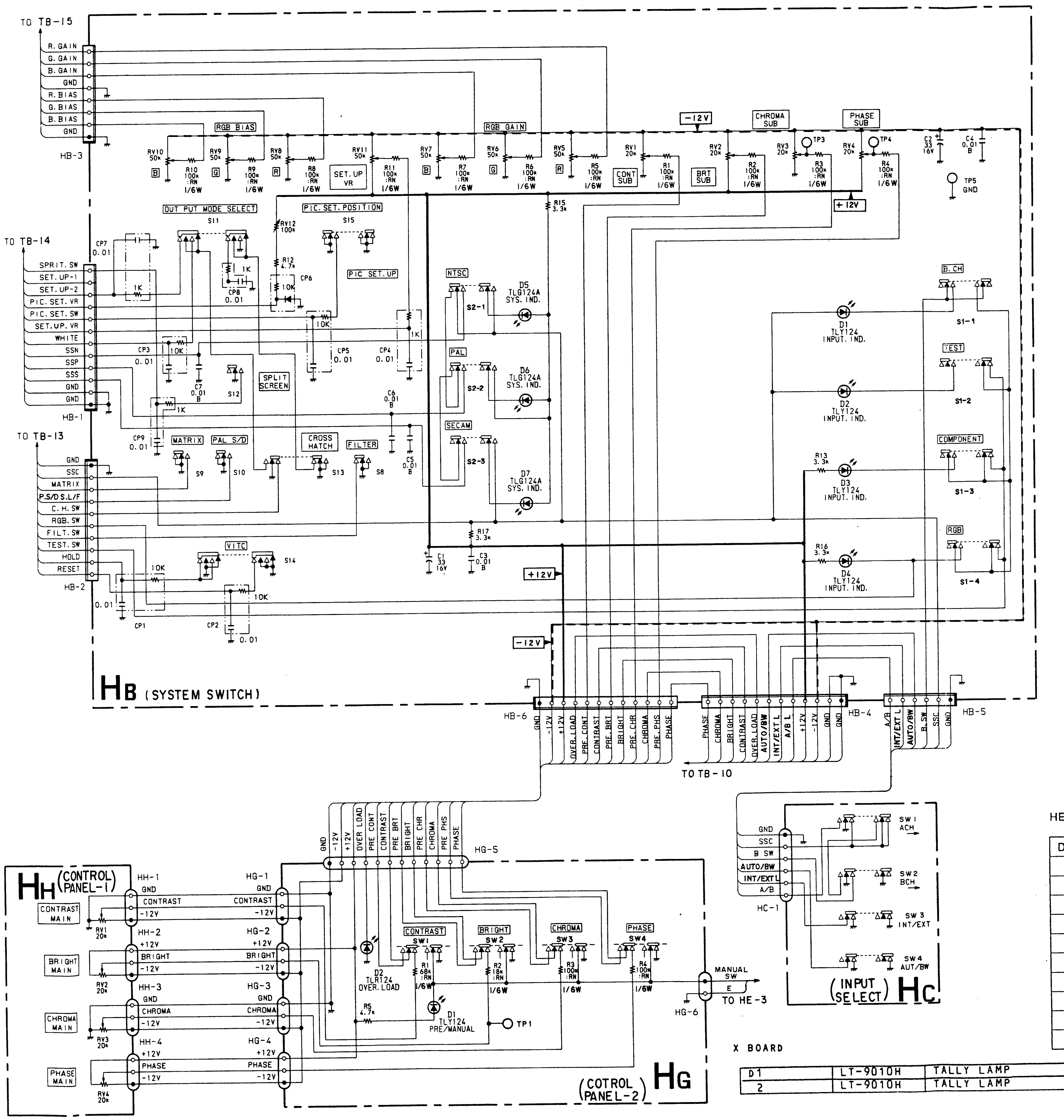
Y board (POWER LED)

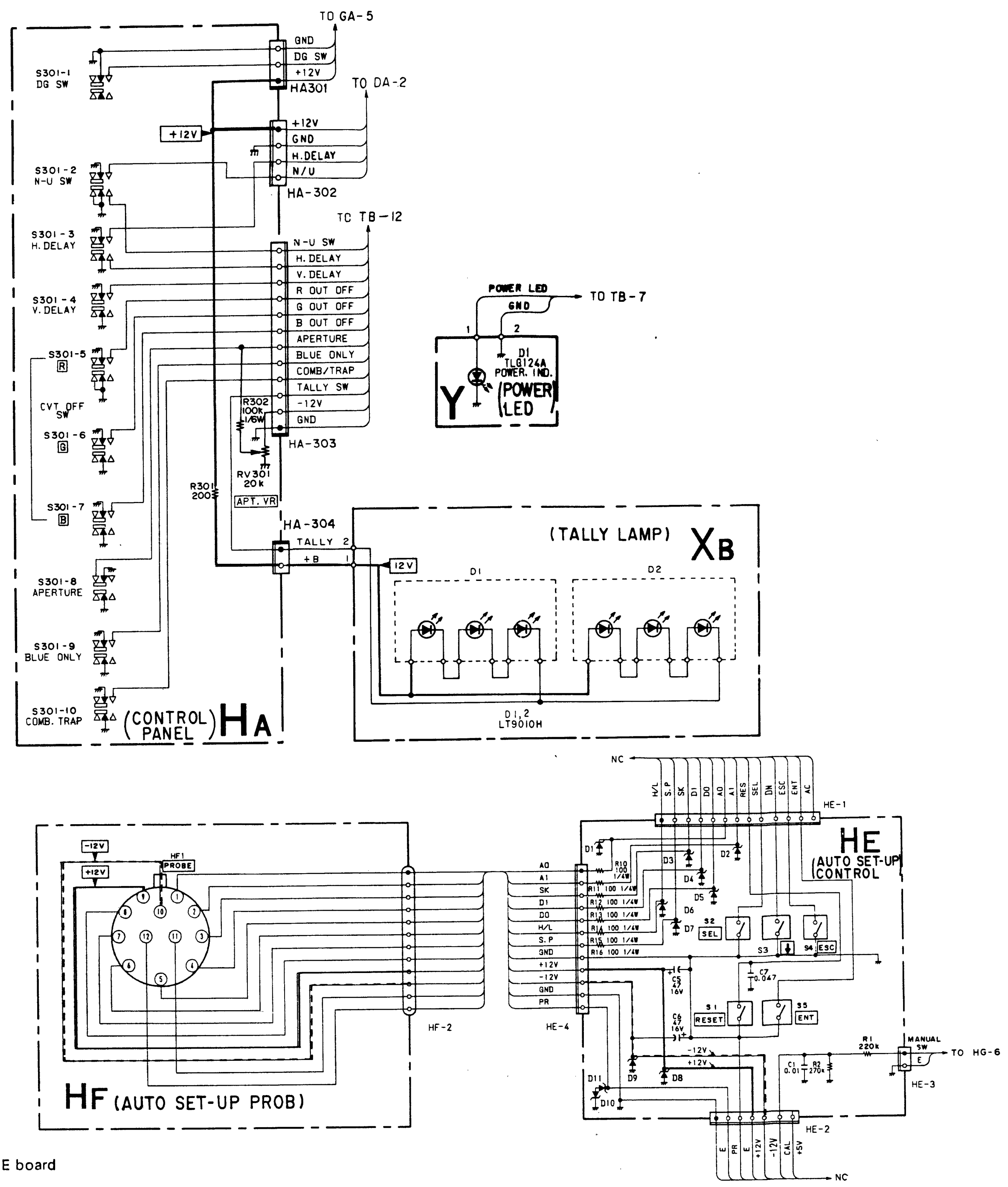

Y
D1
1-631-679-11
②
①
SONY

HF board (AUTO SET-UP PROBE)


12
1
HF-2 (TO HE-4)
1-623-001-11
HF-1 (TO PROBE)
5
12
11
9
1
HF
SONY

HA board (MANUAL CONTROL), HB board (SYSTEM SWITCH), HC board (INPUT SELECT)
HE board (AUTO SET-UP CONTROL), HF board (AUTO SET-UP PROBE), HH board (CONTROL PANEL 1),
HG board (CONTROL PANEL 2), XB board (TALLY), Y board (POWER LED)


TO TB-15
R.GAIN
G.GAIN
B.GAIN
GND
R.BIAS
G.BIAS
B.BIAS
HB-3
RGB BIAS
RGB GAIN
-12V
CHROMA SUB
PHASE SUB
SET.UP VR
CONT SUB
BRT SUB
+12V
TP5 GND
TO TB-14
SPRIT.SW
SET.UP-1
SET.UP-2
PIC.SET.VR
PIC.SET.SW
SET.UP.VR
WHITE
SSN
SSP
SSS
GND
HB-1
OUT PUT MODE SELECT
S11
PIC.SET.POSITION
S15
PIC SET.UP
SPLIT SCREEN
S12
NTSC
PAL
SECAM
S2-1
S2-2
S2-3
D5 TLG124A SYS.IND.
D6 TLG124A SYS.IND.
D7 TLG124A SYS.IND.
D1 TLY124 INPUT.IND.
D2 TLY124 INPUT.IND.
D3 TLY124 INPUT.IND.
D4 TLY124 INPUT.IND.
B.CH
TEST
COMPONENT
RGB
S1-1
S1-2
S1-3
S1-4
TO TB-13
GND
SSC
MATRIX
P.S/D S.L/F
C.H.SW
RGB.SW
FILT.SW
TEST.SW
HOLD
RESET
HB-2
MATRIX
PAL S/D
CROSS HATCH
FILTER
S9
S10
S13
S8
VITC
S14
HB (SYSTEM SWITCH)
HB-6
HB-4
HB-5
TO TB-10
HH (CONTROL PANEL-1)
HH-1
HH-2
HH-3
HH-4
CONTRAST MAIN
BRIGHT MAIN
CHROMA MAIN
PHASE MAIN
HG-1
HG-2
HG-3
HG-4
HG-5
HG-6
CONTRAST SW1
BRIGHT SW2
CHROMA SW3
PHASE SW4
D2 TLR124 OVER.LOAD
D1 TLY124 PRE/MANUAL
TP1
MANUAL SW
TO HE-3
HG (COTROL PANEL-2)
HC-1
GND
SSC
B SW
AUTO/BW
INT/EXT L
A/B
SW1 ACH
SW2 BCH
SW3 INT/EXT
SW4 AUT/BW
HC (INPUT SELECT)


TO GA-5
GND
DG SW
+12V
HA301
TO DA-2
+12V
GND
H.DELAY
N/U
HA-302
TO TB-12
N-U SW
H.DELAY
V.DELAY
R OUT OFF
G OUT OFF
B OUT OFF
APERTURE
BLUE ONLY
COMB/TRAP
TALLY SW
-12V
GND
HA-303
HA-304
S301-1 DG SW
S301-2 N-U SW
S301-3 H.DELAY
S301-4 V.DELAY
S301-5
CVT OFF SW
S301-6
S301-7
S301-8 APERTURE
S301-9 BLUE ONLY
S301-10 COMB.TRAP
RV301 20k
APT.VR
HA (CONTROL PANEL)
POWER LED
GND
TO TB-7
D1 TLG124A POWER.IND.
Y (POWER LED)
(TALLY LAMP) XB
TALLY
+B
D1
D2
D1,2 LT9010H
HF1 PROBE
HF (AUTO SET-UP PROB)
HF-2
HE-1
HE-2
HE-3
HE-4
HE AUTO SET-UP CONTROL
SEL
ESC
RESET
ENT
MANUAL SW
TO HG-6
NC

HE board

D			
D	1	RD5.6ES-B2	PROTECTOR
	2	RD5.6ES-B2	PROTECTOR
	3	RD5.6ES-B2	PROTECTOR
	4	RD5.6ES-B2	PROTECTOR
	5	RD5.6ES-B2	PROTECTOR
	6	RD5.6ES-B2	PROTECTOR
	7	RD5.6ES-B2	PROTECTOR
	8	RD13ES-B2	PROTECTOR
	9	RD13ES-B2	PROTECTOR
	10	RD13ES-B2	PROTECTOR
	11	RD13ES-B2	PROTECTOR

HB BOARD

D1	TLY124	INPUT MODE INDICATOR
2	TLY124	INPUT MODE INDICATOR
3	TLY124	INPUT MODE INDICATOR
4	TLY124	INPUT MODE INDICATOR
5	TLG124A	SYSTEM INDICATOR
6	TLG124A	SYSTEM INDICATOR
7	TLG124A	SYSTEM INDICATOR

HG BOARD

D1	TLY124	PRE/MANUAL INDICATOR
2	TLR124	OVER LOAD INDICATOR

X BOARD

D1	LT-9010H	TALLY LAMP
2	LT-9010H	TALLY LAMP

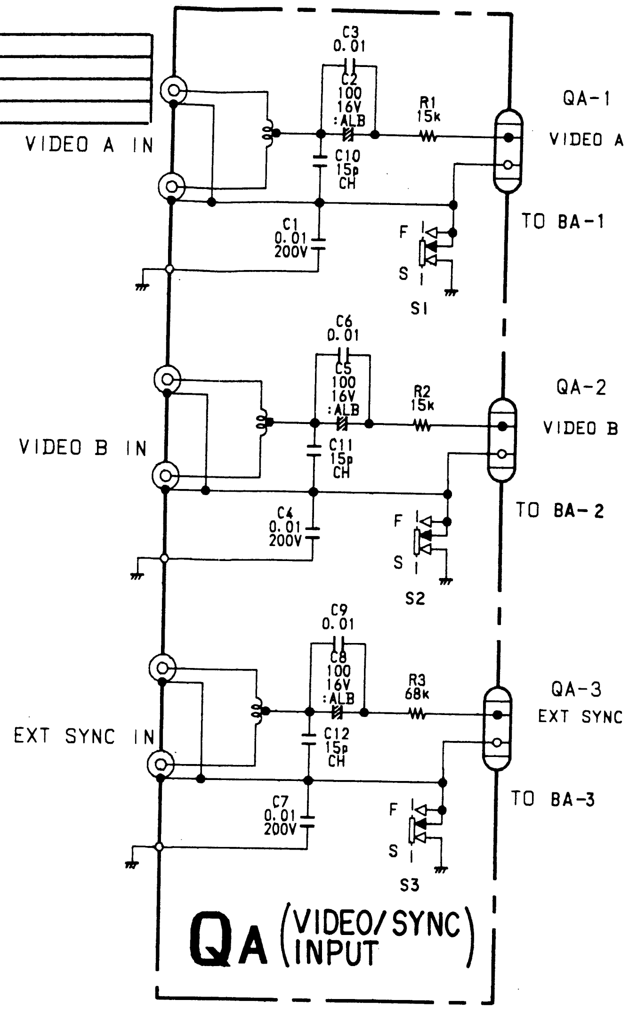
Y BOARD

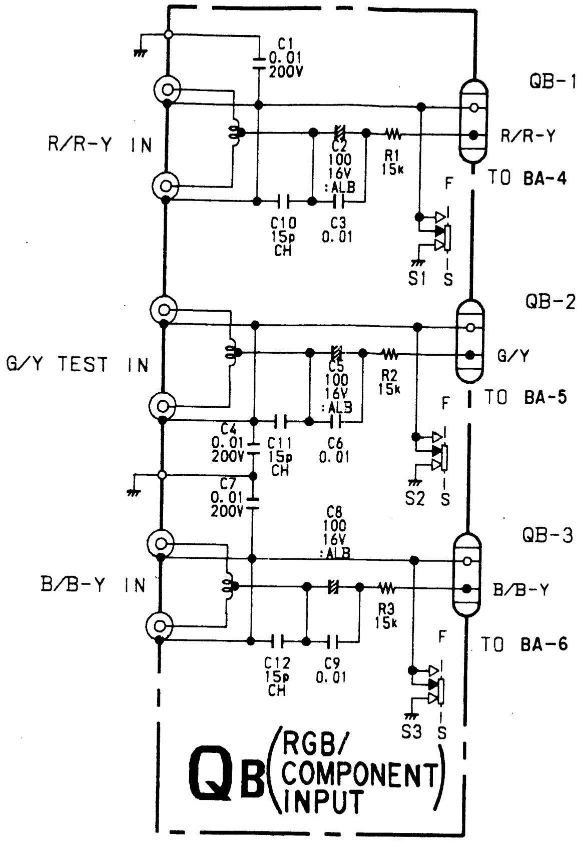
D1	TLG124A	POWER INDICATOR

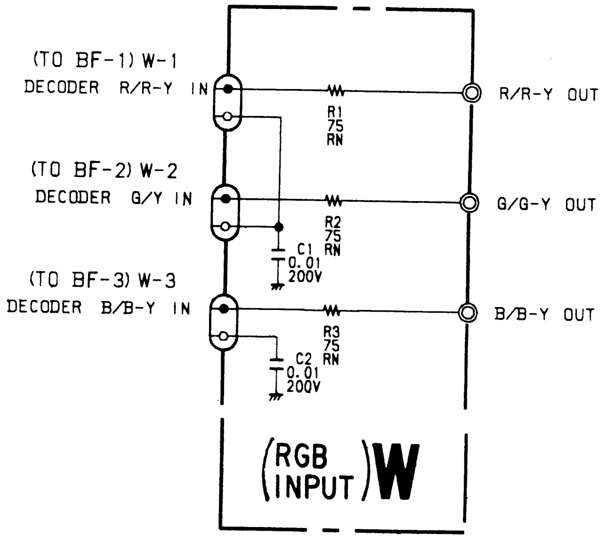
GC board (REG) QA board (COMPOSITE VIDEO INPUT) QB board (RGB/COMPONENT INPUT) V board (REMOTE) W board (RGB/COMPONENT & VECTOR)

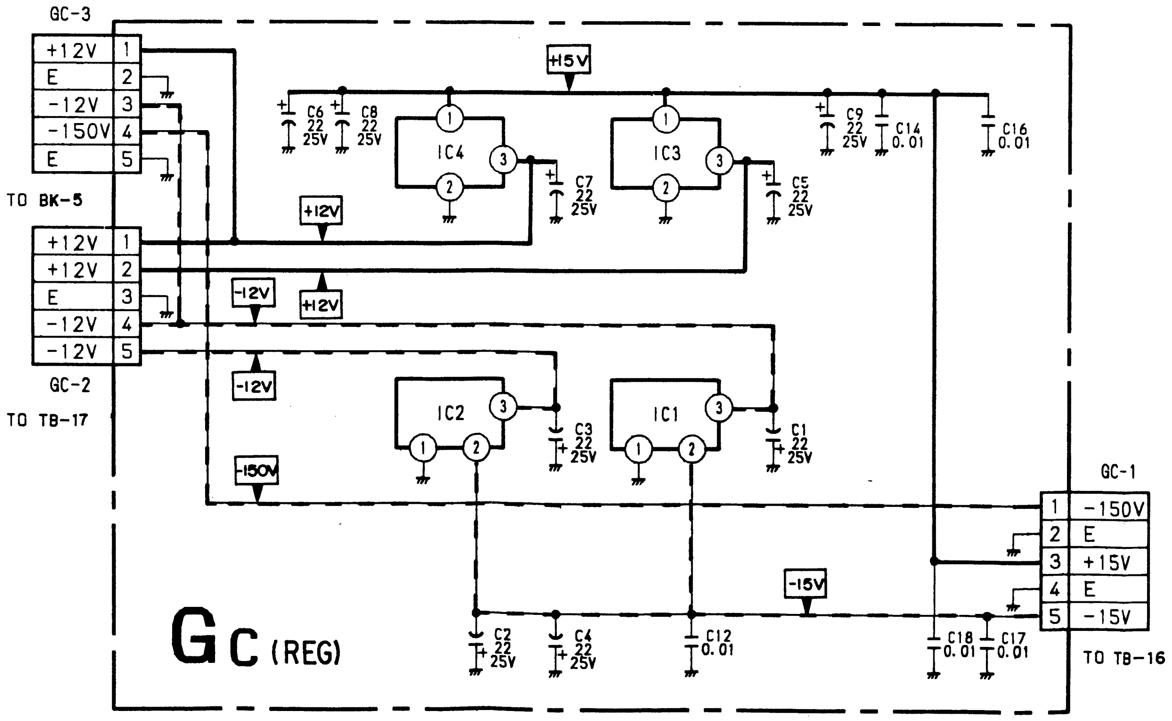
GC BOARD

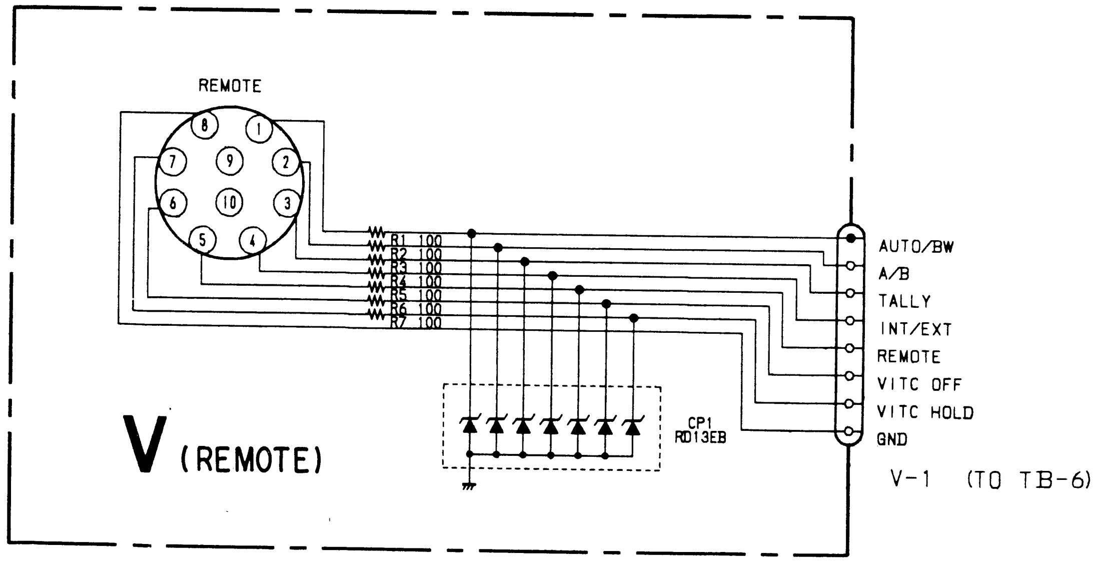
IC1	LM7912CT	-12V REG
2	LM7912CT	-12V REG
3	LM7912CT	+12V REG
4	LM7912CT	+12V REG


QA (VIDEO/SYNC INPUT)
VIDEO A IN
VIDEO B IN
EXT SYNC IN
QA-1
VIDEO A
TO BA-1
QA-2
VIDEO B
TO BA-2
QA-3
EXT SYNC
TO BA-3
C3 0.01
C2 100 16V :ALB
R1 15k
C10 15p CH
C1 0.01 200V
C6 0.01
C5 100 16V :ALB
R2 15k
C11 15p CH
C4 0.01 200V
C9 0.01
C8 100 16V :ALB
R3 68k
C12 15p CH
C7 0.01 200V
F
S
S1
S2
S3

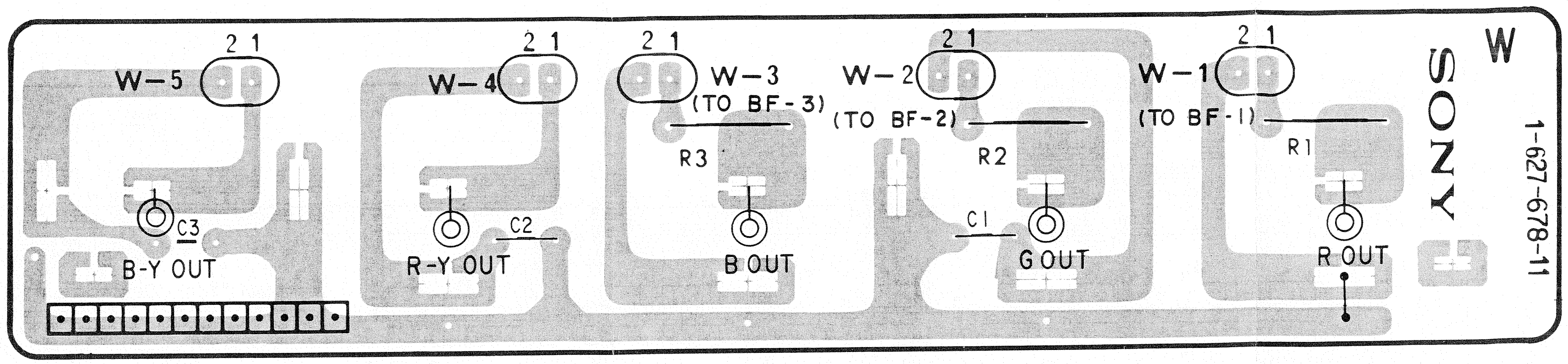

QB (RGB/ COMPONENT INPUT)
R/R-Y IN
G/Y TEST IN
B/B-Y IN
QB-1
R/R-Y
TO BA-4
QB-2
G/Y
TO BA-5
QB-3
B/B-Y
TO BA-6
C1 0.01 200V
C2 100 16V :ALB
R1 15k
C10 15p CH
C3 0.01
C5 100 16V :ALB
R2 15k
C4 0.01 200V
C11 15p CH
C6 0.01
C7 0.01 200V
C8 100 16V :ALB
R3 15k
C12 15p CH
C9 0.01
F
S
S1
S2
S3


(RGB INPUT) W
(TO BF-1) W-1
DECODER R/R-Y IN
(TO BF-2) W-2
DECODER G/Y IN
(TO BF-3) W-3
DECODER B/B-Y IN
R1 75 RN
R2 75 RN
R3 75 RN
C1 0.01 200V
C2 0.01 200V
R/R-Y OUT
G/G-Y OUT
B/B-Y OUT

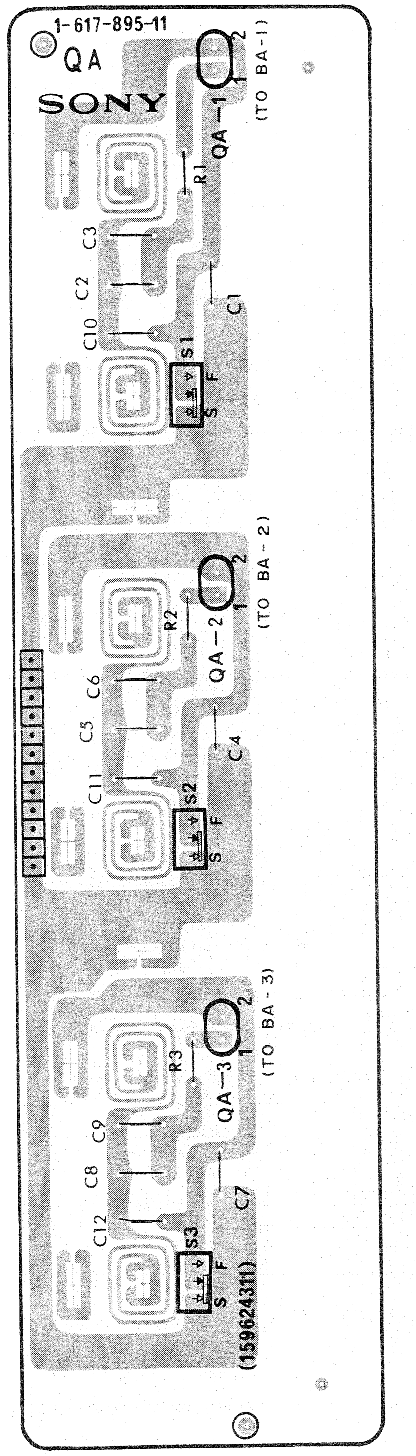

GC (REG)
GC-3
+12V 1
E 2
-12V 3
-150V 4
E 5
TO BK-5
+12V 1
+12V 2
E 3
-12V 4
-12V 5
GC-2
TO TB-17
+15V
+12V
-12V
+12V
-12V
-150V
-15V
IC4
IC3
IC2
IC1
C6 22 25V
C8 22 25V
C7 22 25V
C5 22 25V
C9 22 25V
C14 0.01
C16 0.01
C3 22 25V
C1 22 25V
C2 22 25V
C4 22 25V
C12 0.01
C18 0.01
C17 0.01
GC-1
1 -150V
2 E
3 +15V
4 E
5 -15V
TO TB-16


V (REMOTE)
REMOTE
R1 100
R2 100
R3 100
R4 100
R5 100
R6 100
R7 100
CP1 RD13EB
AUTO/BW
A/B
TALLY
INT/EXT
REMOTE
VITC OFF
VITC HOLD
GND
V-1 (TO TB-6)

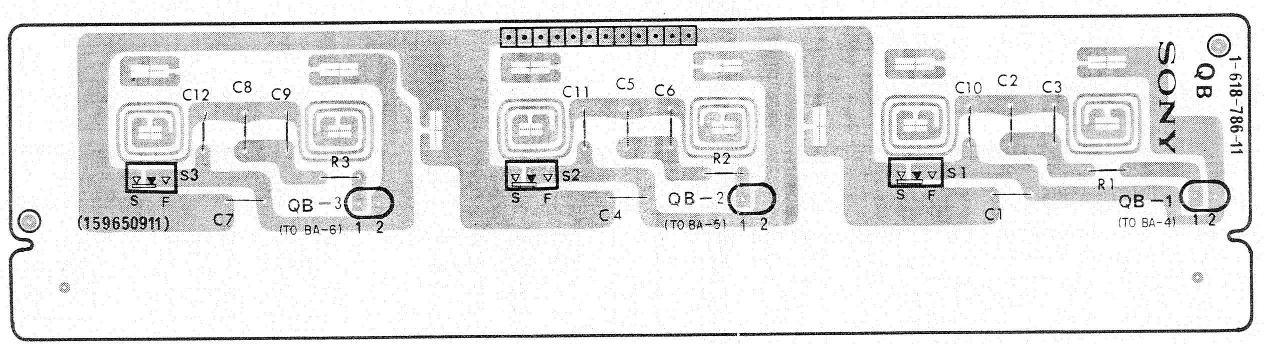
W board (RGB/COMPONENT & VECTOR)


W
SONY
1-627-678-11
W-5
W-4
W-3
(TO BF-3)
W-2
(TO BF-2)
W-1
(TO BF-1)
2 1
R3
R2
R1
C3
C2
C1
B-Y OUT
R-Y OUT
B OUT
G OUT
R OUT

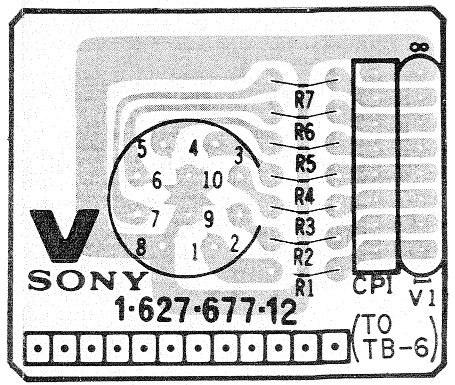
QA board (COMPOSITE VIDEO INPUT)


1-617-895-11
QA
SONY
QA-1
QA-2
QA-3
(TO BA-1)
(TO BA-2)
(TO BA-3)
R1
R2
R3
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
S1
S2
S3
S F
(159624311)

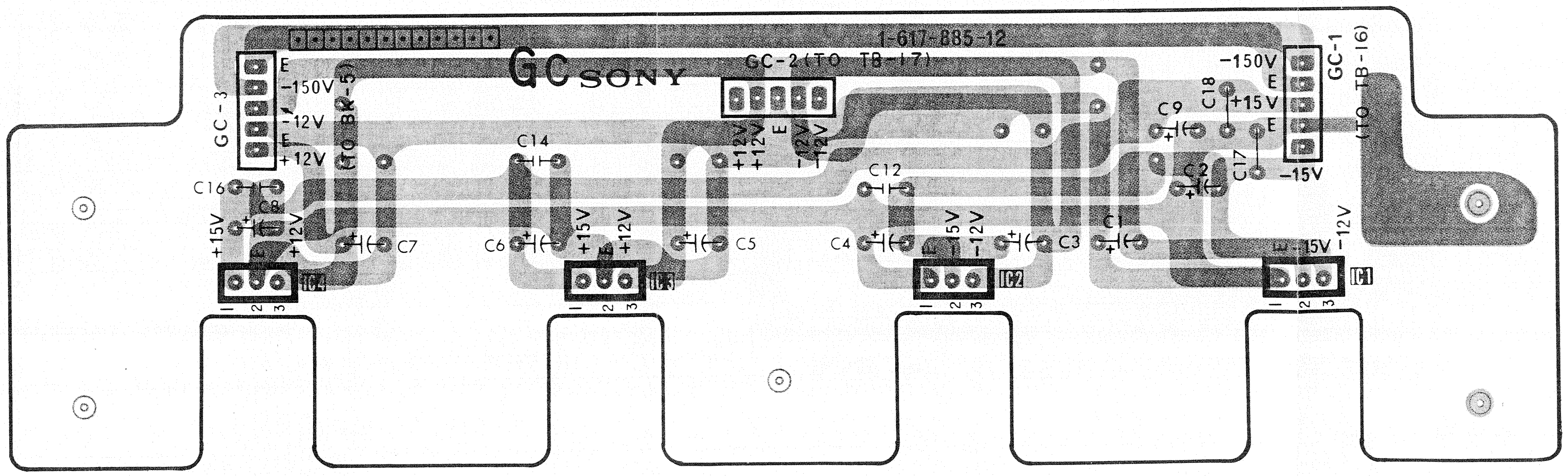
QB board (RGB/COMPONENT INPUT)


QB
SONY
1-618-786-11
C12
C8
C9
C11
C5
C6
C10
C2
C3
S3
S2
S1
S F
R3
R2
R1
C7
C4
C1
QB-3
QB-2
QB-1
(TO BA-6)
(TO BA-5)
(TO BA-4)
1 2
(159650911)

V board (REMOTE)


V
SONY
1·627·677·12
R7
R6
R5
R4
R3
R2
R1
CP1
V1
(TO TB-6)
1
2
3
4
5
6
7
8
9
10

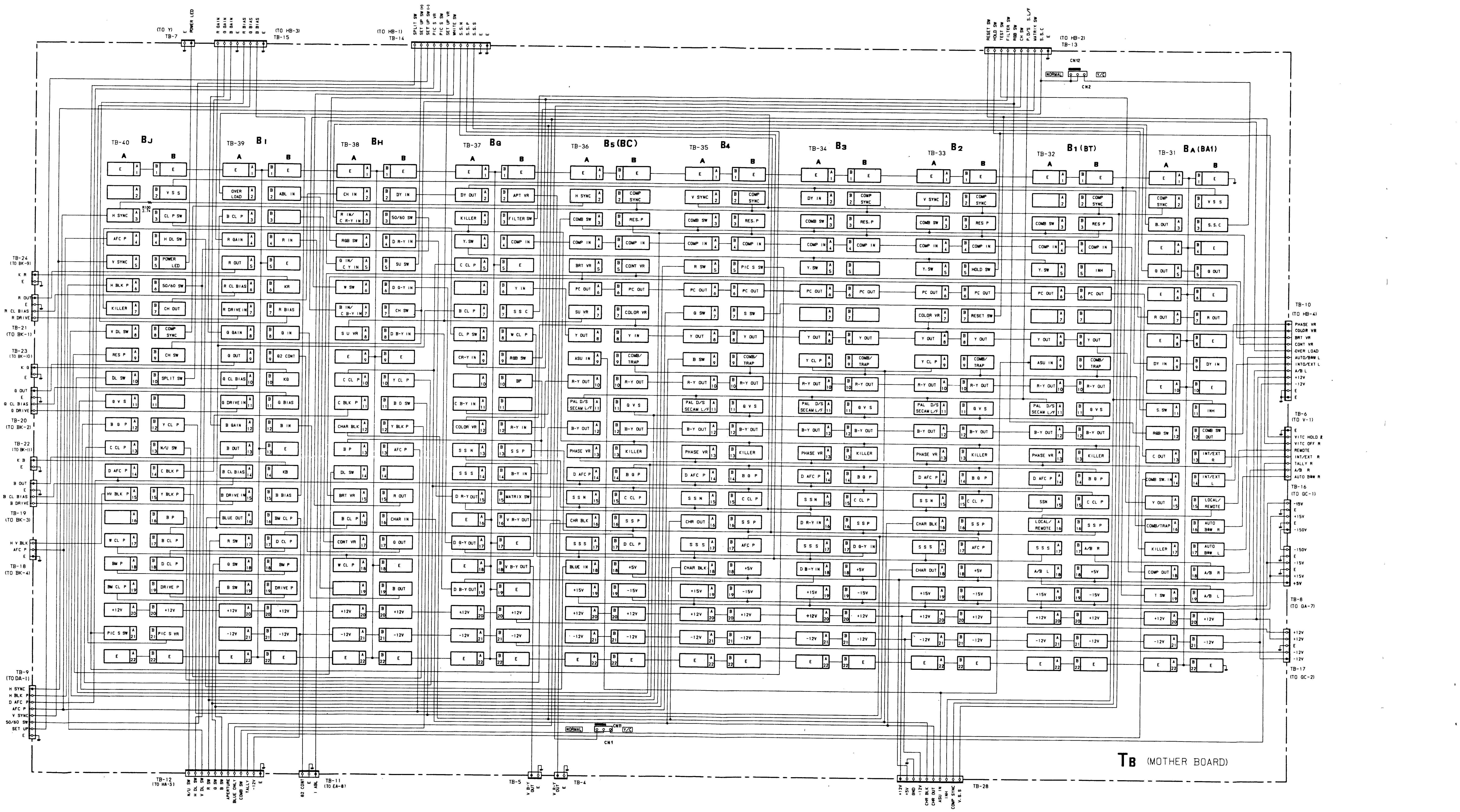
GC board (REG)


1-617-885-12
GC SONY
GC-2 (TO TB-17)
GC-3
(TO BR-5)
GC-1
(TO TB-16)
E
-150V
-12V
+12V
+15V
-15V
C1
C2
C3
C4
C5
C6
C7
C8
C9
C12
C14
C16
C17
C18
IC1
IC2
IC3
IC4
1 2 3

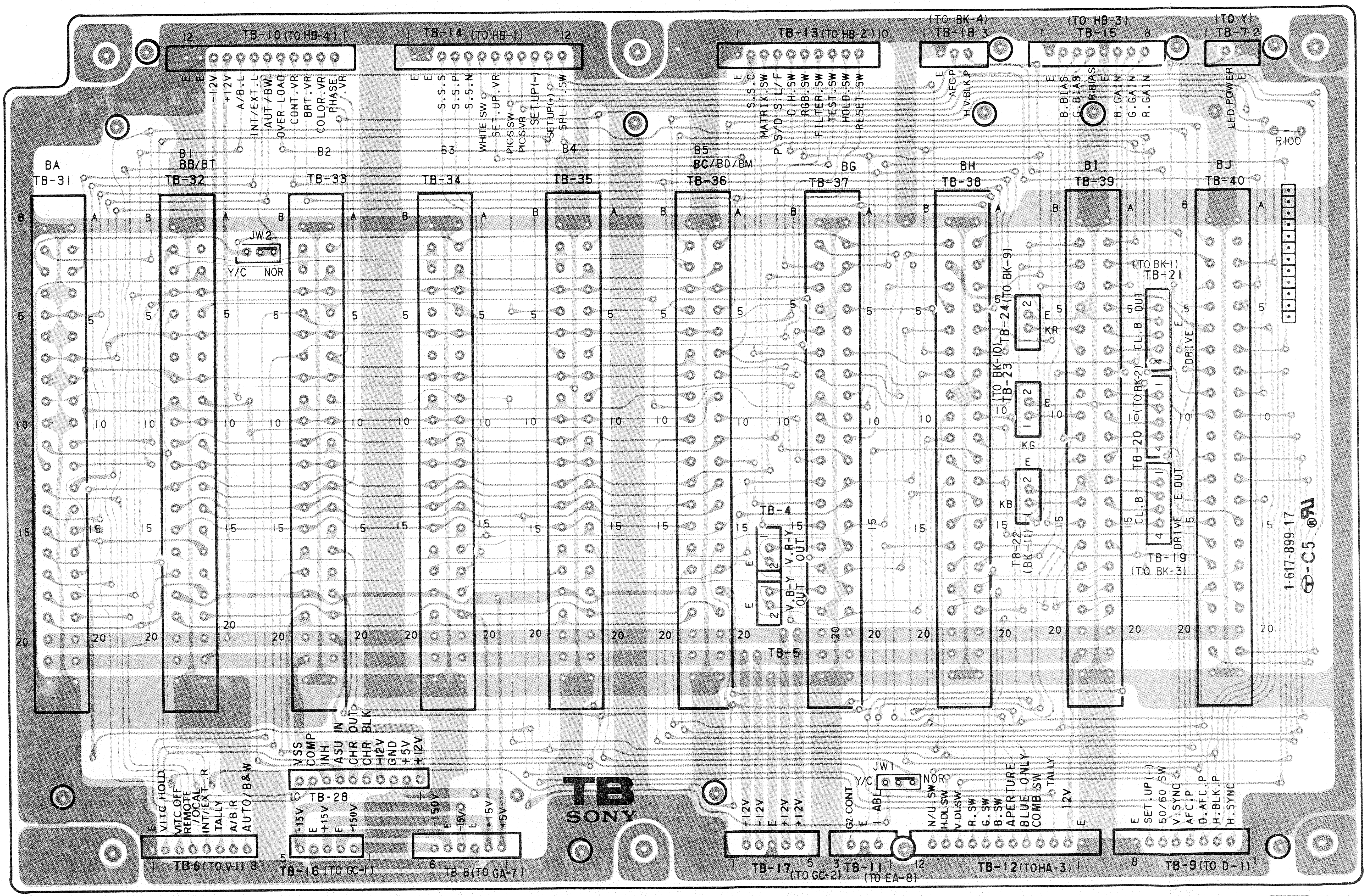
● ▨ : Conductor side pattern

● ▨ : Component side pattern

TB board (MOTHER BOARD)


(TO Y) TB-7
POWER LED
(TO HB-3) TB-15
(TO HB-1) TB-14
(TO HB-2) TB-13
CN12
NORMAL
Y/C
CN2
TB-40 BJ
TB-39 BI
TB-38 BH
TB-37 BG
TB-36 B5(BC)
TB-35 B4
TB-34 B3
TB-33 B2
TB-32 B1(BT)
TB-31 BA(BA1)
A
B
TB-24 (TO BK-9)
TB-21 (TO BK-1)
TB-23 (TO BK-10)
TB-20 (TO BK-2)
TB-22 (TO BK-11)
TB-19 (TO BK-3)
TB-18 (TO BK-4)
TB-9 (TO DA-1)
TB-10 (TO HB-4)
TB-6 (TO V-1)
TB-16 (TO GC-1)
TB-8 (TO GA-7)
TB-17 (TO GC-2)
TB-12 (TO HA-3)
TB-11 (TO EA-8)
TB-5
TB-4
TB-28
CN11
CN1
TB (MOTHER BOARD)

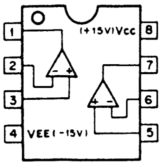
TB board (MOTHER BOARD)


TB-10 (TO HB-4)
E E -12V +12V A/B.L INT/EXT.L AUT/BW.L OVER LOAD CONT.VR BRT.VR COLOR.VR PHASE.VR
TB-14 (TO HB-1)
E E S.S.S S.S.P S.S.N WHITE SW SET.UP.VR PICS/SW PICS/VR SET.UP(-) SETUP(+) SPLIT.SW
TB-13 (TO HB-2)
E S.S.C MATRIX.SW P.S/D.S.L/F C.H.SW RGB.SW FILTER.SW TEST.SW HOLD.SW RESET.SW
(TO BK-4) TB-18
E AFC.P H.V.BLK.P
(TO HB-3) TB-15
E B.BIAS G.BIAS R.BIAS E B.GAIN G.GAIN R.GAIN
(TO Y) TB-7
LED POWER E
R100
BA TB-31
B1 BB/BT TB-32
B2 TB-33
B3 TB-34
B4 TB-35
B5 BC/BD/BM TB-36
BG TB-37
BH TB-38
BI TB-39
BJ TB-40
JW2 Y/C NOR
TB-24 (TO BK-9) KR
TB-23 (TO BK-10) KG
TB-22 (BK-11) KB
(TO BK-1) TB-21 CL.B OUT DRIVE E
TB-20 (TO BK-2)
TB-19 (TO BK-3) CL.B E OUT DRIVE
TB-4 V.R-Y OUT V.B-Y OUT
TB-5
1-617-899-17
-C5
VSS COMP INH ASU IN CHR OUT CHR BLK H2V GND +5V +12V
TB-28
V.ITC HOLD V.ITC OFF REMOTE/LOCAL INT/EXT R TALLY A/B.R AUTO/B&W
TB-6 (TO V-1)
-15V E +15V E -150V
TB-16 (TO GC-1)
-150V E -15V +15V +5V
TB 8 (TO GA-7)
TB SONY
+12V -12V E +12V +12V
TB-17 (TO GC-2)
G2.CONT E ABL
TB-11 (TO EA-8)
JW1 Y/C NOR
N/U.SW H.DL.SW V.DL.SW R.SW G.SW B.SW APERTURE BLUE ONLY COMB.SW TALLY -12V E
TB-12 (TO HA-3)
E SET.UP(-) 50/60 SW V.SYNC AFC.P D.AFC.P H.BLK.P H.SYNC
TB-9 (TO D-1)

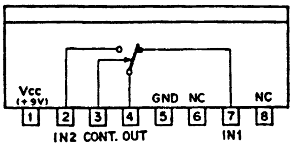
- ▨: Conductor side pattern
- ▨: Component side pattern

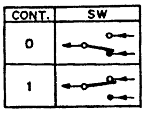
5-4. SEMICONDUCTORS

BA4558 (ROHM)
HA17558 (HITACHI)
NJM4558D (JRC)
uPC4558C (NEC)
OPERATIONAL AMPLIFIER
— TOP VIEW —


1
2
3
4
VEE(-15V)
(+15V)Vcc
8
7
6
5

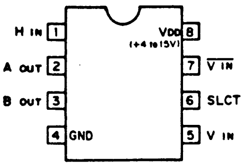
CX20061 (SONY)
ANALOG SWITCH
- SIDE VIEW -

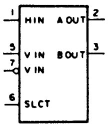

Vcc
(+9V)
GND
NC
NC
1
2
3
4
5
6
7
8
IN2
CONT.
OUT
IN1



0 ; LOW LEVEL
1 ; HIGH LEVEL

CX23025 (SONY)
C-MOS TV·VTR SYNC SIGNAL DISCRIMINATOR
— TOP VIEW —


H IN
1
A OUT
2
B OUT
3
4
GND
VDD
(+4 to 15V)
8
7
$\overline{\text{V IN}}$
6
SLCT
5
V IN


1
HIN
A OUT
2
5
V IN
B OUT
3
7
V IN
6
SLCT

A OUT ; SYNC SIGNAL DISCRIMINATION OUTPUT
B OUT ; SYNC SIGNAL DISCRIMINATION OUTPUT
H IN HORIZONTAL SYNC INPUT
SLCT ; POWER ON INITIALIZED SELECT INPUT
V IN ; VERTICAL SYNC INPUT
$\overline{\text{V IN}}$; VERTICAL SYNC INPUT

POWER ON INITIALIZED

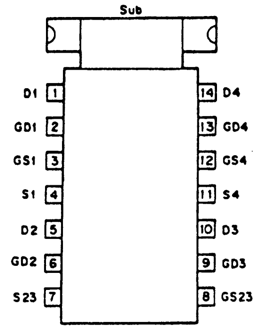
SLCT INPUT	A OUTPUT	B OUTPUT
1	0	1
0	1	0

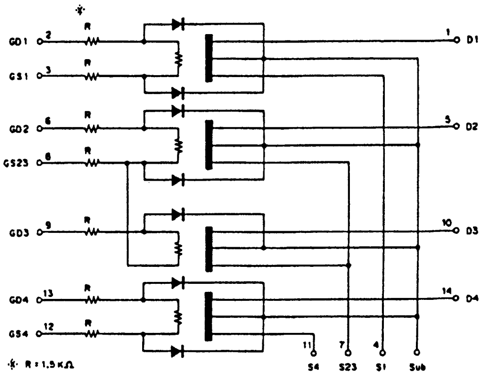
DISCRIMINATION

V SYNC INPUT FREQUENCY	OUTPUTS	
	A	B
50Hz	0	1
60Hz	1	0

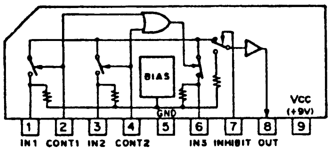
0 ; LOW LEVEL
1 ; HIGH LEVEL

CX-718D (SONY)
SRG FET IC
- TOP VIEW -

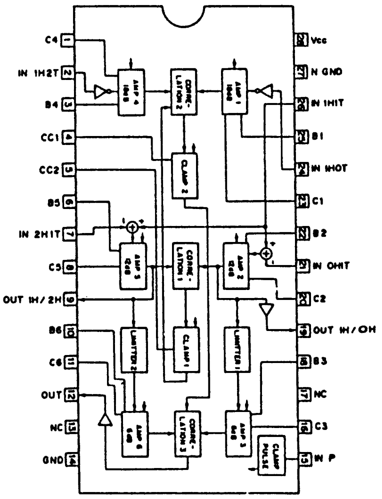

Sub
D1
1
GD1
2
GS1
3
S1
4
D2
5
GD2
6
S23
7
14
D4
13
GD4
12
GS4
11
S4
10
D3
9
GD3
8
GS23


※
GD1
2
R
GS1
3
R
GD2
6
R
GS23
8
R
GD3
9
R
GD4
13
R
GS4
12
R
1
D1
5
D2
10
D3
14
D4
11
S4
7
S23
4
S1
Sub
※ R = 1.5KΩ

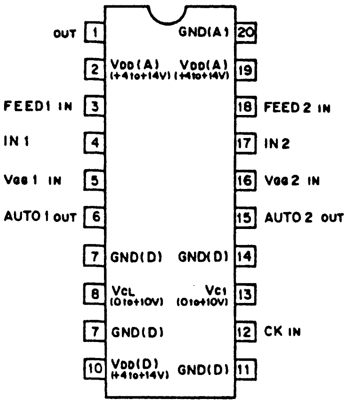
CX894 (SONY)
3 INPUT SWITCH
- SIDE VIEW -


BIAS
GND
Vcc
(+9V)
1
2
3
4
5
6
7
8
9
IN1
CONT1
IN2
CONT2
IN3
INHIBIT
OUT

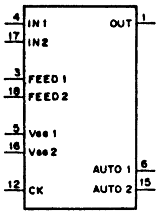
CXA1539P


C4
1
IN 1H2T
2
B4
3
CC1
4
CC2
5
B5
6
IN 2H1T
7
C5
8
OUT 1H/2H
9
B6
10
C6
11
OUT
12
NC
13
GND
14
Vcc
28
N GND
27
IN 1H1T
26
B1
25
IN 1HOT
24
C1
23
B2
22
IN OH1T
21
C2
20
OUT 1H/OH
19
B3
18
NC
17
C3
16
IN P
15
AMP 4 18dB
CORRE-LATION 2
AMP 1 18dB
CLAMP 2
AMP 5 12dB
CORRE-LATION 1
AMP 2 12dB
LIMITTER 2
CLAMP 1
LIMITTER 1
AMP 6 6dB
CORRE-LATION 3
AMP 3 6dB
CLAMP PULSE

CXL1009P (SONY)
C-MOS CCD SIGNAL PROCESSOR FOR TBC
— TOP VIEW —

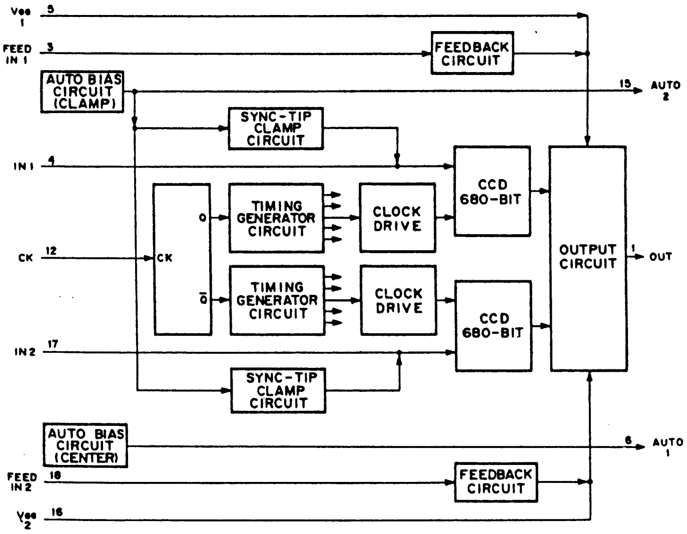


OUT 1
2 VDD(A) (+4 to +14V)
FEED1 IN 3
IN 1 4
VGG 1 IN 5
AUTO 1 OUT 6
7 GND(D)
8 VCL (0 to +10V)
7 GND(D)
10 VDD(D) (+4 to +14V)
GND(A) 20
VDD(A) (+4 to +14V) 19
18 FEED 2 IN
17 IN 2
16 VGG 2 IN
15 AUTO 2 OUT
GND(D) 14
VCL (0 to +10V) 13
12 CK IN
GND(D) 11



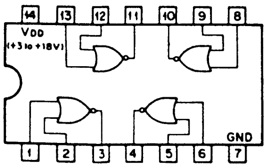
4 IN 1
17 IN 2
3 FEED 1
18 FEED 2
5 VGG 1
16 VGG 2
12 CK
OUT 1
AUTO 1 6
AUTO 2 15

OUT	; OUT PUT
FEED 1/2 IN	; FEEDBACK INPUT 1/2
IN 1/2	; INPUT 1/2
VGG 1/2 IN	; GATE INPUT 1/2
AUTO 1/2 OUT	; AUTO BIAS OUTPUT 1/2
CK IN	; CLOCK INPUT
VCL	; POWER SUPPLY 2 (DIGITAL)
VDD (A)/(D)	; POWER SUPPLY 1 (ANALOG)/(DIGITAL)
GND (A)/(D)	; GROUND (ANALOG)/(DIGITAL)

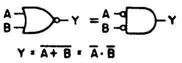


VGG 1 5
FEED IN 1 3
FEEDBACK CIRCUIT
AUTO BIAS CIRCUIT (CLAMP)
15 AUTO 2
SYNC-TIP CLAMP CIRCUIT
IN 1 4
CCD 680-BIT
TIMING GENERATOR CIRCUIT
CLOCK DRIVE
CK 12
CK
OUTPUT CIRCUIT
1 OUT
TIMING GENERATOR CIRCUIT
CLOCK DRIVE
CCD 680-BIT
IN 2 17
SYNC-TIP CLAMP CIRCUIT
AUTO BIAS CIRCUIT (CENTER)
6 AUTO 1
FEED IN 2 18
FEEDBACK CIRCUIT
VGG 2 16

HD14001BP (HITACHI)
MC14001BCP (MOTOROLA)
TC4001BP (TOSHIBA)
uPD4001BC (NEC)
C-MOS 2-INPUT NOR GATE
— TOP VIEW —



14 13 12 11 10 9 8
VDD (+3 to +18V)
GND
1 2 3 4 5 6 7

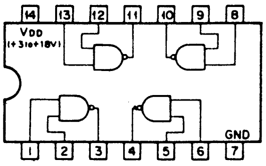


$Y = \overline{A+B} = \overline{A} \cdot \overline{B}$

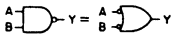
A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL

HD14011BP (HITACHI)
MC14011BCP (MOTOROLA)
TC4011BP (TOSHIBA)
uPD4011BC (NEC)
C-MOS 2-INPUT NAND GATE
— TOP VIEW —



14 13 12 11 10 9 8
VDD (+3 to +18V)
GND
1 2 3 4 5 6 7

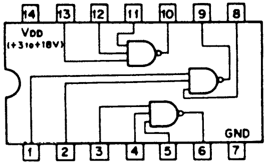


$Y = \overline{A \cdot B} = \overline{A} + \overline{B}$

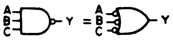
A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

0 : LOW LEVEL
1 : HIGH LEVEL

HD14023BP
MC14023BCP (MOTOROLA)
TC4023BP (TOSHIBA)
uPD4023BC (NEC)
C-MOS 3-INPUT NAND GATE
— TOP VIEW —



14 13 12 11 10 9 8
VDD (+3 to +18V)
GND
1 2 3 4 5 6 7

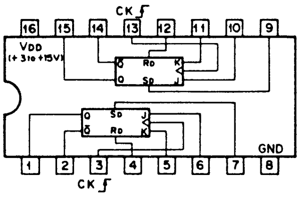


$Y = \overline{A \cdot B \cdot C} = \overline{A} + \overline{B} + \overline{C}$

A	B	C	Y
X	X	0	1
X	0	X	1
0	X	X	1
1	1	1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

HD14027BP (HITACHI)
MB84027B (FUJITSU)
MC14027BCP (MOTOROLA)
TC504027BP (TOSHIBA)
uPD4027BC (NEC)
C-MOS J-K MASTER SLAVE FLIP-FLOP WITH DIRECT SET/RESET
— TOP VIEW —



CK
16 15 14 13 12 11 10 9
VDD (+3 to +15V)
Q
Q̄
RD
SD
J
K
GND
1 2 3 4 5 6 7 8
CK

DIRECT R-S FLIP FLOP

SD	RD	Q
0	0	Qn
0	1	0
1	0	1
1	1	1

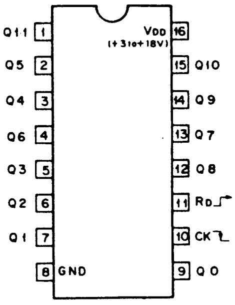
0 ; LOW LEVEL
1 ; HIGH LEVEL

J-K FLIP FLOP

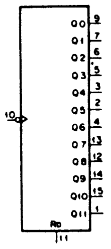
tn		tn+1
J	K	Q
0	0	Qn
0	1	0
1	0	1
1	1	$\overline{Qn}$

CK ; ⨍
tn ; BEFORE CLOCK
tn+1 ; AFTER CLOCK

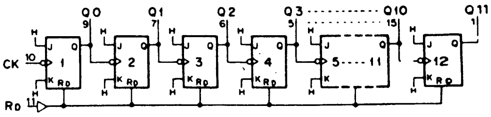
HD14040BP (HITACHI)
MC14040BCP (MOTOROLA)
TC4040BP (TOSHIBA)
uPD4040C (NEC)
C-MOS 12-STAGE RIPPLE CARRY BINARY COUNTER/DRIVER
— TOP VIEW —



Q11 1
Q5 2
Q4 3
Q6 4
Q3 5
Q2 6
Q1 7
8 GND
VDD (+3 to +18V) 16
15 Q10
14 Q9
13 Q7
12 Q8
11 RD
10 CK
9 Q0



10
Q0 9
Q1 7
Q2 6
Q3 5
Q4 3
Q5 2
Q6 4
Q7 13
Q8 12
Q9 14
Q10 15
Q11 1
RD
11



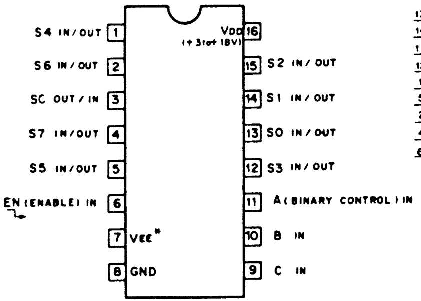
Q0
Q1
Q2
Q3 .... Q10
Q11
9
7
6
5
15
1
H
J
Q
K
RD
CK 10
1
2
3
4
5 ····· 11
12
RD 11

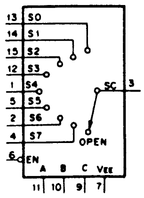
COUNT	Q11	Q10	Q9	Q8	Q7	Q6	Q5	Q4	Q3	Q2	Q1	Q0
0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	1
2	0	0	0	0	0	0	0	0	0	0	1	0
3	0	0	0	0	0	0	0	0	0	0	1	1
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
4095	1	1	1	1	1	1	1	1	1	1	1	1

RD	Q11 ········ Q0
1	ALL LOW
0	COUNT

0 ; LOW LEVEL
1 ; HIGH LEVEL

HD14051BP (HITACHI)
TC4051BP (TOSHIBA)
uPD4051BC (NEC)
C-MOS 8-CHANNEL MULTIPLEXER/DEMULTIPLEXER
— TOP VIEW —


S4 IN/OUT 1
S6 IN/OUT 2
SC OUT/IN 3
S7 IN/OUT 4
S5 IN/OUT 5
EN (ENABLE) IN 6
7 VEE*
8 GND
VDD 16
(+3 to +18V)
15 S2 IN/OUT
14 S1 IN/OUT
13 S0 IN/OUT
12 S3 IN/OUT
11 A (BINARY CONTROL) IN
10 B IN
9 C IN

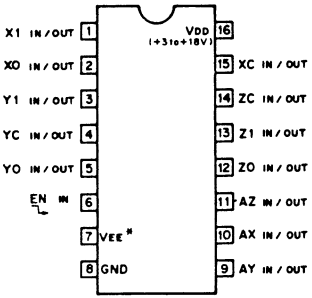

13 S0
14 S1
15 S2
12 S3
1 S4
5 S5
2 S6
4 S7
6 EN
SC 3
OPEN
A B C VEE
11 10 9 7

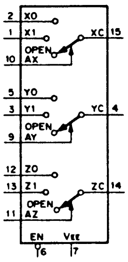
VEE* ; VDD - VEE : + 3 to + 18V

EN	C	B	A	"ON" CHANNEL
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	X	X	X	OPEN

0 : LOW LEVEL
1 : HIGH LEVEL
X : DON'T CARE

HD14053BP (HITACHI)
MC14053BCP (MOTOROLA)
TC4053BPHB (TOSHIBA)
uPD4053BC (NEC)
C-MOS 2-CHANNEL MULTIPLEXER/DEMULTIPLEXER
— TOP VIEW —


X1 IN/OUT 1
X0 IN/OUT 2
Y1 IN/OUT 3
YC IN/OUT 4
Y0 IN/OUT 5
EN IN 6
7 VEE*
8 GND
VDD 16
(+3 to +18V)
15 XC IN/OUT
14 ZC IN/OUT
13 Z1 IN/OUT
12 Z0 IN/OUT
11 AZ IN/OUT
10 AX IN/OUT
9 AY IN/OUT

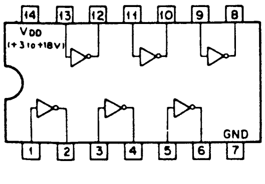

2 X0
1 X1
XC 15
OPEN
10 AX
5 Y0
3 Y1
YC 4
OPEN
9 AY
12 Z0
13 Z1
ZC 14
OPEN
11 AZ
EN VEE
6 7

VEE* ; VDD - VEE : + 3 to + 18 V

CONT. INPUTS		ON CHANNEL
EN	A (X,Y,Z,)	
0	0	0
0	1	1
1	X	OPEN

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE.

HD14069UBP (HITACHI)
MC14069BCP (MOTOROLA)
TC4069UBP (TOSHIBA)
uPD4069UBC (NEC)
C-MOS INVERTER
— TOP VIEW —

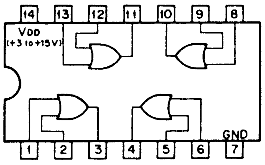

14 13 12 11 10 9 8
VDD
(+3 to +18V)
GND
1 2 3 4 5 6 7

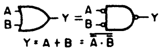
$Y = \overline{A}$

A	Y
0	1
1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL

HD14071BP (HITACHI)
MC14071BCP (MOTOROLA)
TC4071BP (TOSHIBA)
uPD4071BC (NEC)
C-MOS 2-INPUT OR GATE
— TOP VIEW —


14 13 12 11 10 9 8
VDD
(+3 to +15V)
GND
1 2 3 4 5 6 7

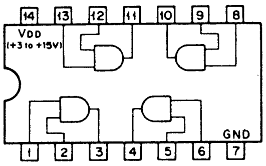


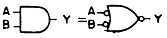
$Y = A + B = \overline{\overline{A} \cdot \overline{B}}$

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

0 ; LOW LEVEL
1 ; HIGH LEVEL

HD14081BP (HITACHI)
MC14081BCP (MOTOROLA)
TC4081BP (TOSHIBA)
uPD4081BC (NEC)
C-MOS 2-INPUT AND GATE
— TOP VIEW —


14 13 12 11 10 9 8
VDD
(+3 to +15V)
GND
1 2 3 4 5 6 7

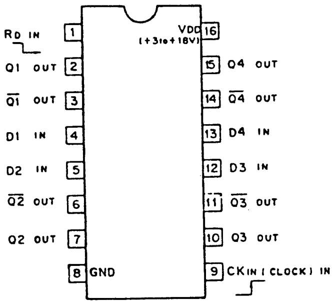


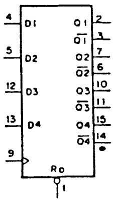
$Y = A \cdot B = \overline{\overline{A} + \overline{B}}$

A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

0; LOW LEVEL
1; HIGH LEVEL

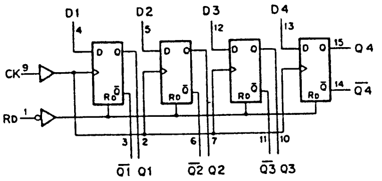
HD14175BP (HITACHI)
MC14175BCP (MOTOROLA)
TC40175BP (TOSHIBA)
µPD4175BC (NEC)
C-MOS DECADE COUNTER/DIVIDER
— TOP VIEW —


RD IN 1
Q1 OUT 2
$\overline{Q1}$ OUT 3
D1 IN 4
D2 IN 5
$\overline{Q2}$ OUT 6
Q2 OUT 7
8 GND
VDD 16
(+3 to +18V)
15 Q4 OUT
14 $\overline{Q4}$ OUT
13 D4 IN
12 D3 IN
11 $\overline{Q3}$ OUT
10 Q3 OUT
9 CK IN (CLOCK) IN

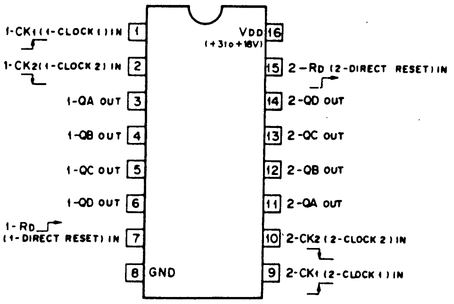

4 D1
5 D2
12 D3
13 D4
9
Q1 2
$\overline{Q1}$ 3
Q2 7
$\overline{Q2}$ 6
Q3 10
$\overline{Q3}$ 11
Q4 15
$\overline{Q4}$ 14
RD
1

CK	D	RD	Q	$\overline{Q}$
↑	0	1	0	1
↑	1	1	1	0
↓	X	1	Q_0	$\overline{Q}_0$
X	X	0	0	1

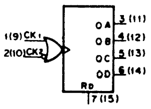
0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE


D1
4
D2
5
D3
12
D4
13
CK 9
RD 1
D Q
RD $\overline{Q}$
15 Q4
14 $\overline{Q4}$
3 2
6 7
11 10
$\overline{Q1}$ Q1
$\overline{Q2}$ Q2
$\overline{Q3}$ Q3

HD14520BP (HITACHI)
MC14520BCP (MOTOROLA)
TC4520BP (TOSHIBA)
TC4520BPHB (TOSHIBA)
uPD4520BC (NEC)
C-MOS DUAL 4-BIT BINARY UP COUNTER
— TOP VIEW —


1-CK1 (1-CLOCK 1) IN
1
1-CK2 (1-CLOCK 2) IN
2
1-QA OUT
3
1-QB OUT
4
1-QC OUT
5
1-QD OUT
6
1-RD
(1-DIRECT RESET) IN
7
8
GND
VDD
(+3 to +18V)
16
15
2-RD (2-DIRECT RESET) IN
14
2-QD OUT
13
2-QC OUT
12
2-QB OUT
11
2-QA OUT
10
2-CK2 (2-CLOCK 2) IN
9
2-CK1 (2-CLOCK 1) IN

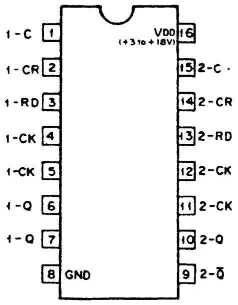
STATE	OUTPUTS			
	QD	QC	QB	QA
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

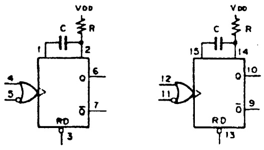

1(9) CK1
2(10) CK2
QA
QB
QC
QD
RD
3 (11)
4 (12)
5 (13)
6 (14)
7 (15)

CK1	CK2	RD	ACTION
↑	1	0	INCREMENT COUNTER
0	↓	0	INCREMENT COUNTER
↓	X	0	NO CHANGE
X	↑	0	NO CHANGE
↑	0	0	NO CHANGE
1	↓	0	NO CHANGE
X	X	1	QA THRU QD = 0

0;LOW LEVEL
1;HIGH LEVEL
X;DON'T CARE

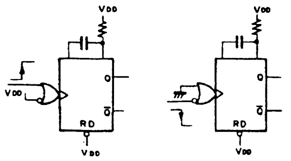
HD14538BP (HITACHI)
C-MOS DUAL RETRIGGERABLE MONOSTABLE MULTIVIBRATOR
- TOP VIEW -


1-C
1
1-CR
2
1-RD
3
1-CK
4
1-CK
5
1-Q
6
1-Q
7
8
GND
VDD
(+3 to +18V)
16
15
2-C
14
2-CR
13
2-RD
12
2-CK
11
2-CK
10
2-Q
9
2-Q̄

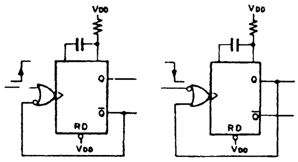

VDD
C
R
1
2
4
5
6
Q
Q̄
7
RD
3
VDD
C
R
15
14
12
11
10
Q
Q̄
9
RD
13

OUTPUT PULSE WIDTH = C·R

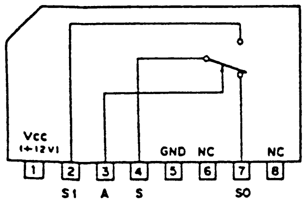
RETRIGGERABLE M.M.V

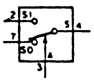

VDD
VDD
Q
Q̄
RD
VDD
VDD
Q
Q̄
RD
VDD

NON-RETRIGGERABLE M.M.V


VDD
Q
Q̄
RD
VDD
VDD
Q
Q̄
RD
VDD

LA7016 (SANYO)
ELECTRONIC SWITCH
— SIDE VIEW —

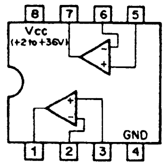

VCC
(+12V)
GND
NC
NC
1
2
3
4
5
6
7
8
S1
A
S
SO


2
S1
7
SO
S
4
A
3

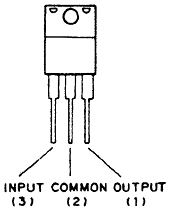
CONT IN A	ON CHANNEL
0	SO
1	S1

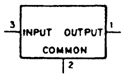
0 ; LOW LEVEL
1 ; HIGH LEVEL

LM2903DQ (RAYTHEON)
DUAL VOLTAGE COMPARATORS
- TOP VIEW -

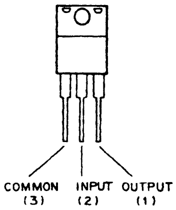

8
7
6
5
Vcc
(+2 to +36V)
GND
1
2
3
4

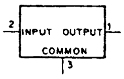
LM7812CT (NSC) + 12V
RC7809FA (RAYTHEON) + 9V
RC78M05FA (RAYTHEON) + 5V
POSITIVE VOLTAGE REGULATOR
- FRONT VIEW -


INPUT
(3)
COMMON
(2)
OUTPUT
(1)

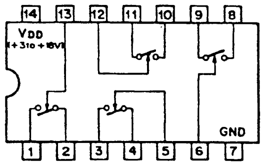

3
INPUT
OUTPUT
1
COMMON
2

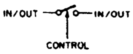
LM7912CT (NS) - 12V
RC79M05FA (RAYTHEON) - 5V
NEGATIVE VOLTAGE REGULATOR
- FRONT VIEW -


COMMON
(3)
INPUT
(2)
OUTPUT
(1)


2
INPUT
OUTPUT
1
COMMON
3

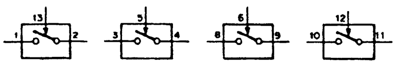
MC14066BCP (MOTOROLA)
C-MOS BILATERAL ANALOG SWITCH
- TOP VIEW -


14
13
12
11
10
9
8
VDD
(+3 to +18V)
GND
1
2
3
4
5
6
7

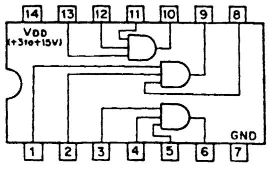

IN/OUT
IN/OUT
CONTROL

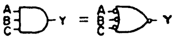
CONTROL	SWITCH
0	OFF
1	ON

0;LOW LEVEL
1;HIGH LEVEL


13
1
2
5
3
4
6
8
9
12
10
11

MC14073BCP (MOTOROLA)
C-MOS 3-INPUT POSITIVE AND GATE
- TOP VIEW -


14
13
12
11
10
9
8
VDD
(+3 to +15V)
GND
1
2
3
4
5
6
7

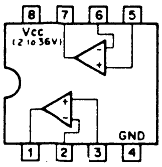


$Y = A \cdot B \cdot C = \overline{\bar{A} + \bar{B} + \bar{C}}$

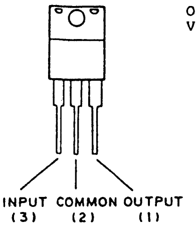
A	B	C	Y
X	X	0	0
X	0	X	0
0	X	X	0
1	1	1	1

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

NJM2903D (JRC)
VOLTAGE COMPARATOR
— TOP VIEW —

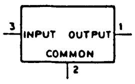

8
7
6
5
Vcc
(2 to 36V)
GND
1
2
3
4

NJM78 ? ?FA (JRC)
POSITIVE VOLTAGE REGULATOR
– FRONT VIEW –

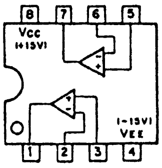

INPUT
COMMON
OUTPUT
(3)
(2)
(1)

NJM78M??FA

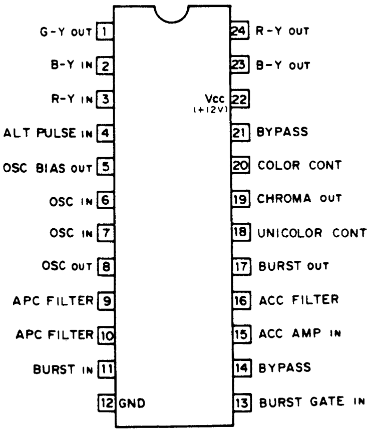
OUTPUT VOLTAGE	NJM78M??FA	NJM78??FA	RC78M??FA	RC78??FA
+5V	NJM78M05FA	NJM7805FA	RC78M05FA	RC7805FA
+6V	NJM78M06FA	NJM7806FA	RC78M06FA	RC7806FA
+8V	NJM78M08FA	NJM7808FA	---------	RC7808FA
+9V	NJM78M09FA	NJM7809FA	RC78M09FA	RC7809FA
+12V	NJM78M12FA	NJM7812FA	RC78M12FA	RC7812FA
+15V	NJM78M15FA	NJM7815FA	RC78M15FA	RC7815FA
+18V	NJM78M18FA	NJM7818FA	---------	RC7818FA
+20V	NJM78M20FA	NJM7820FA	---------	RC7820FA
+24V	NJM78M24FA	NJM7824FA	---------	RC7824FA

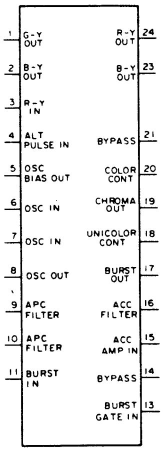

3
INPUT
OUTPUT
1
COMMON
2

RC4558P (RAYTHEON)
DUAL OPERATIONAL AMPLIFIER
– TOP VIEW –

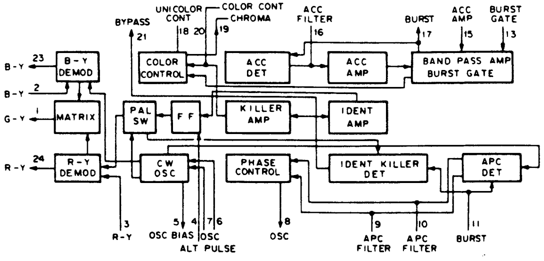

8
7
6
5
Vcc
(+15V)
(-15V)
VEE
1
2
3
4

TA7193P (TOSHIBA)
TV CHROMA PROCESS (PAL)
— TOP VIEW —

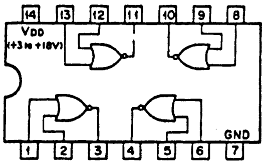

G-Y OUT 1
B-Y IN 2
R-Y IN 3
ALT PULSE IN 4
OSC BIAS OUT 5
OSC IN 6
OSC IN 7
OSC OUT 8
APC FILTER 9
APC FILTER 10
BURST IN 11
12 GND
24 R-Y OUT
23 B-Y OUT
Vcc (+12V) 22
21 BYPASS
20 COLOR CONT
19 CHROMA OUT
18 UNICOLOR CONT
17 BURST OUT
16 ACC FILTER
15 ACC AMP IN
14 BYPASS
13 BURST GATE IN

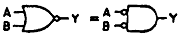

1 G-Y OUT
2 B-Y OUT
3 R-Y IN
4 ALT PULSE IN
5 OSC BIAS OUT
6 OSC IN
7 OSC IN
8 OSC OUT
9 APC FILTER
10 APC FILTER
11 BURST IN
R-Y OUT 24
B-Y OUT 23
BYPASS 21
COLOR CONT 20
CHROMA OUT 19
UNICOLOR CONT 18
BURST OUT 17
ACC FILTER 16
ACC AMP IN 15
BYPASS 14
BURST GATE IN 13

OUT ; OUTPUT
IN ; INPUT
CONT ; CONTROL


UNICOLOR CONT
COLOR CONT
CHROMA
ACC FILTER
BURST
ACC AMP
BURST GATE
BYPASS
21
18
20
19
16
17
15
13
B-Y
23
B-Y DEMOD
COLOR CONTROL
ACC DET
ACC AMP
BAND PASS AMP BURST GATE
B-Y
2
G-Y
1
MATRIX
PAL SW
F F
KILLER AMP
IDENT AMP
R-Y
24
R-Y DEMOD
CW OSC
PHASE CONTROL
IDENT KILLER DET
APC DET
3
R-Y
5
OSC BIAS
4
7
6
OSC
ALT PULSE
8
OSC
9
APC FILTER
10
APC FILTER
11
BURST

TC4001BP (TOSHIBA)
C-MOS 2-INPUT NOR GATE
– TOP VIEW –


14
13
12
11
10
9
8
VDD
(+3 to +18V)
GND
1
2
3
4
5
6
7

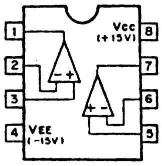


$Y = \overline{A+B} = \bar{A} \cdot \bar{B}$

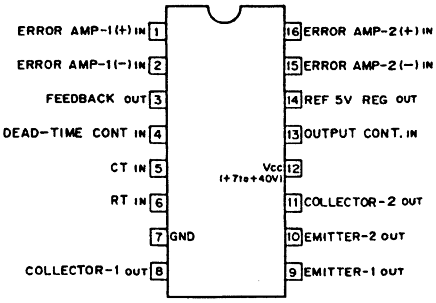
A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

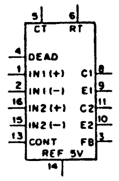
0 ; LOW LEVEL
1 ; HIGH LEVEL

TL082CP (TI)
OPERATIONAL AMPLIFIER
(J FET-INPUT)
– TOP VIEW –


1
2
3
4
Vcc
(+15V)
VEE
(-15V)
8
7
6
5

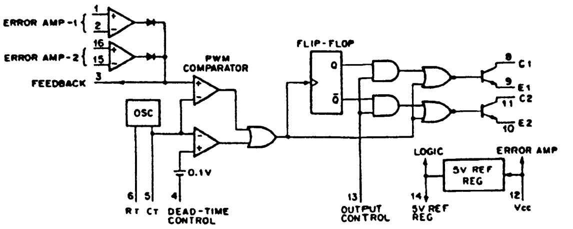
TL494CN (TI)
PWM POWER CONTROL
– TOP VIEW –


ERROR AMP-1(+) IN 1
ERROR AMP-1(-) IN 2
FEEDBACK OUT 3
DEAD-TIME CONT IN 4
CT IN 5
RT IN 6
7 GND
COLLECTOR-1 OUT 8
16 ERROR AMP-2(+) IN
15 ERROR AMP-2(-) IN
14 REF 5V REG OUT
13 OUTPUT CONT. IN
Vcc (+7 to +40V) 12
11 COLLECTOR-2 OUT
10 EMITTER-2 OUT
9 EMITTER-1 OUT

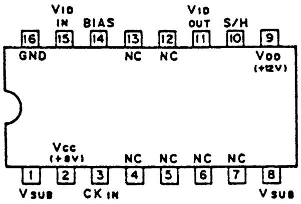

5
6
CT
RT
4
DEAD
1
IN1(+)
2
IN1(-)
16
IN2(+)
15
IN2(-)
13
CONT
C1
8
E1
9
C2
11
E2
10
FB
3
REF 5V
14

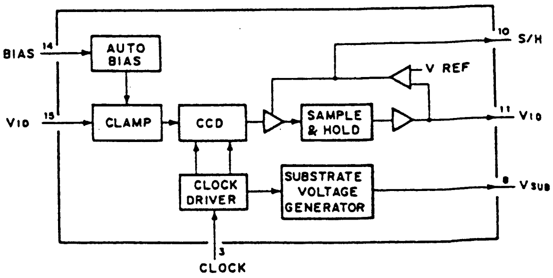
OUTPUT CONTROL	OUTPUT FUNCTION
0	PARALLEL
1	PUSH-PULL

0 ; GROUNDED
1 ; CONNECTED TO PIN 14


ERROR AMP-1
1
2
ERROR AMP-2
16
15
FEEDBACK
3
PWM COMPARATOR
OSC
0.1V
FLIP-FLOP
Q
Q̄
8
C1
9
E1
11
C2
10
E2
LOGIC
ERROR AMP
5V REF REG
6
5
4
RT
CT
DEAD-TIME CONTROL
13
OUTPUT CONTROL
14
5V REF REG
12
Vcc

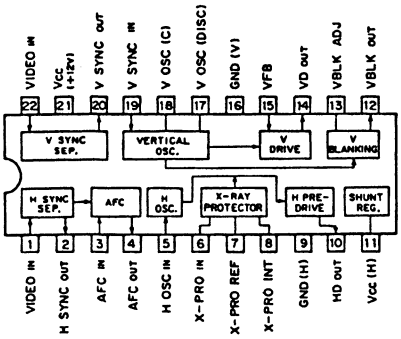
TL8608P (TOSHIBA)
N-CH CCD ANALOG PROCESSING UNIT
– TOP VIEW –


VID IN
BIAS
VID OUT
S/H
16
15
14
13
12
11
10
9
GND
NC
NC
VDD
(+12V)
Vcc
(+8V)
NC
NC
NC
NC
1
2
3
4
5
6
7
8
VSUB
CK IN
VSUB


BIAS
14
AUTO BIAS
10
S/H
V REF
VID
15
CLAMP
CCD
SAMPLE & HOLD
11
VID
CLOCK DRIVER
SUBSTRATE VOLTAGE GENERATOR
8
VSUB
3
CLOCK

UPC1377C (NEC)

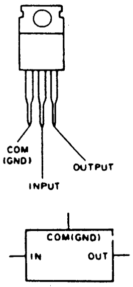
SYNCHRONIZATION SIGNAL PROCESSOR OF COLOR TV
– TOP VIEW –


VIDEO IN
Vcc (+12V)
V SYNC OUT
V SYNC IN
V OSC (C)
V OSC (DISC)
GND (V)
VFB
VD OUT
VBLK ADJ
VBLK OUT
22
21
20
19
18
17
16
15
14
13
12
V SYNC SEP.
VERTICAL OSC.
V DRIVE
V BLANKING
H SYNC SEP.
AFC
H OSC.
X-RAY PROTECTOR
H PRE-DRIVE
SHUNT REG.
1
2
3
4
5
6
7
8
9
10
11
VIDEO IN
H SYNC OUT
AFC IN
AFC OUT
H OSC IN
X-PRO IN
X-PRO REF
X-PRO INT
GND (H)
HD OUT
Vcc (H)

AFC IN ; INPUT OF AFC DETECTOR
AFC OUT ; OUTPUT OF AFC DETECTOR
GND(H) ; GROUND OF HORIZONTAL PART
GND(V) ; GROUND OF VERTICAL PART
HD OUT ; OUTPUT OF HORIZONTAL PULSE
HOSC IN ; INPUT OF HORIZONTAL OSCILLATION
HSYNC OUT ; OUTPUT OF SYNCRONIZATION SIGNAL SEPARATOR
VBLK OUT ; OUTPUT OF VERTICAL BLANKING PULSE
VBLKADJ ; VERTICAL BLANKING PULSE DURATION ADJUST
VCC ; VCC OF VERTICAL PART
VCC(H) ; VCC OF HORIZONTAL PART
VD OUT ; OUTPUT OF VERTICAL AMPLIFIER
VFB ; VERTICAL FEEDBACK
VIDEO IN ; INPUT OF HORIZONTAL/VERTICAL SYNCRONIZATION SIGNAL SEPARATOR
VOSC(C) ; VERTICAL OSCILLATION (CHARGE)
VOSC(DISC) ; VERTICAL OSCILLATION (DISCHARGE)
VSYNC IN ; INPUT OF VERTICAL SYNCRONIZATION SIGNAL
VSYNC OUT ; OUTPUT OF VERTICAL SYNCRONIZATION SIGNAL SEPARATOR
X-PRO IN ; INPUT OF X-RAY PROTECTOR
X-PRO INT ; INTEGRATION CIRCUIT OF X-RAY PROTECTOR
X-PRO REF ; REFERENCE OF X-RAY PROTECTOR

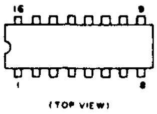
uPC7912H (NEC)

NEGATIVE VOLTAGE REGULATOR (1A)
— SIDE VIEW —

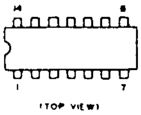

COM (GND)
OUTPUT
INPUT
COM(GND)
IN
OUT

OUTPUT VOLTAGE	AN79??	FS79??	uA79??UC	uPC79??H	MC79??CT
-2V	------	------	--------	--------	MC7902CT
-5V	AN7905	FS7905	uA7905UC	uPC7905H	MC7905CT
-5.2V	------	------	--------	--------	MC7905.2CT
-6V	AN7906	------	uA7906UC	--------	MC7906CT
-7V	AN7907	------	--------	--------	--------
-8V	AN7908	------	uA7908UC	uPC7908H	MC7908CT
-9V	AN7909	------	--------	--------	--------
-10V	AN7910	------	--------	--------	--------
-12V	AN7912	------	uA7912UC	uPC7912H	MC7912CT
-15V	AN7915	------	uA7915UC	uPC7915H	MC7915CT
-18V	AN7918	------	uA7918UC	uPC7918H	MC7918CT
-20V	AN7920	------	--------	--------	--------
-24V	AN7924	------	uA7924UC	uPC7924H	MC7924CT

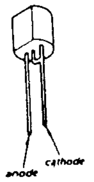
FA5301P


16
9
1
8
(TOP VIEW)

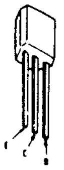
MC5433


14
8
1
7
(TOP VIEW)

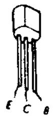
μPC574J


anode
cathode

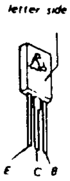
2SA1048
2SA1115
2SC2668
2SC403SP
DTA124ES
DTA144ES
DTC 143TS
DTC144ES



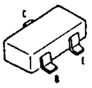
2SA1091
2SA844
2SC1890A
2SC2551
2SC2878
2SC3068



2SA1142
2SA1407
2SC2688
2SD669A
2SC3955
2SC3956


letter side
E
C
B

2SA1162
2SA1226
2SA812
2SC1623
2SC2757
2SC3624A
DTA144EK
DTC144EK



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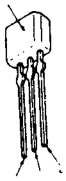
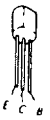
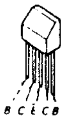
2SC2785



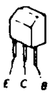
2SA893A
2SC3242
2SD789



2SA979



2SB734
2SD774



2SB858
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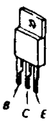
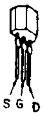
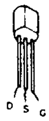
2SC2542
2SC3675
2SD1134
2SD1137
2SD1399



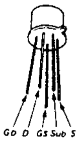
2SK381



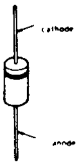
2SK523-K2



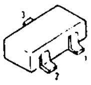
TX-429M



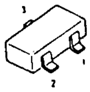
10ES
1SS82
ERB44-06
ERB81-004
ERC24-04S
ERD28-04S
ERD28-08S
GP08D
RD10EB3
RD5.1ES-B1
RD7.5ES-B2
RD9.1EB3
RH-1A
RU-3AM
SIB09-02


cathode
anode

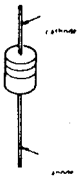
1S2835
1S2836



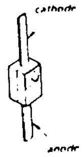
1S2837
MA152WK



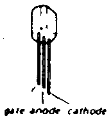
1SS119
1SS133
RD12ES-B2
RD13ES-B2
RD33ES-B2
RD3.0ES-B1
RD20ES-B2
RD3.0ES-B2
RD4.3ES-B1
RD4.3ES-B2
RD5.6ES-B2
RD6.2ES-B2
RD6.8ES-B2
RD8.2ES-B2
RD9.1ES-B2


cathode
anode

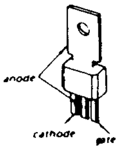
1T25


cathode
anode

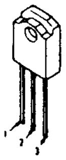
CR02AM4
CR02AM-8


gate
anode
cathode

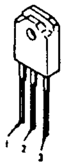
CR3CM-8


anode
cathode
gate

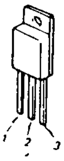
CTU-38R



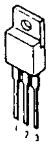
CTU-38S



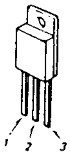
ESAC25-04C



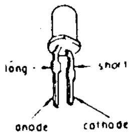
ESAC25-04N
ESAD25-04D



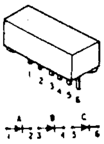
ESAC31-02D



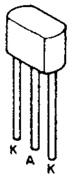
GL3HY8
TLG124A
TLR124
TLY124


long
short
anode
cathode

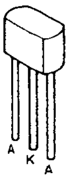
LT9010


1
2
3
4
5
6
A
B
C
1
2
3
4
5
6

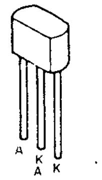
MC911



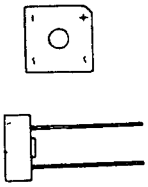
MC921



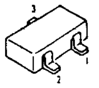
MC932



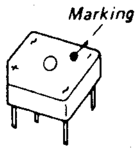
RB406N



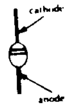
RD5.6M-B2



S3WB60Z



U05G
V11N


cathode
anode

SECTION 6
EXPLODED VIEWS

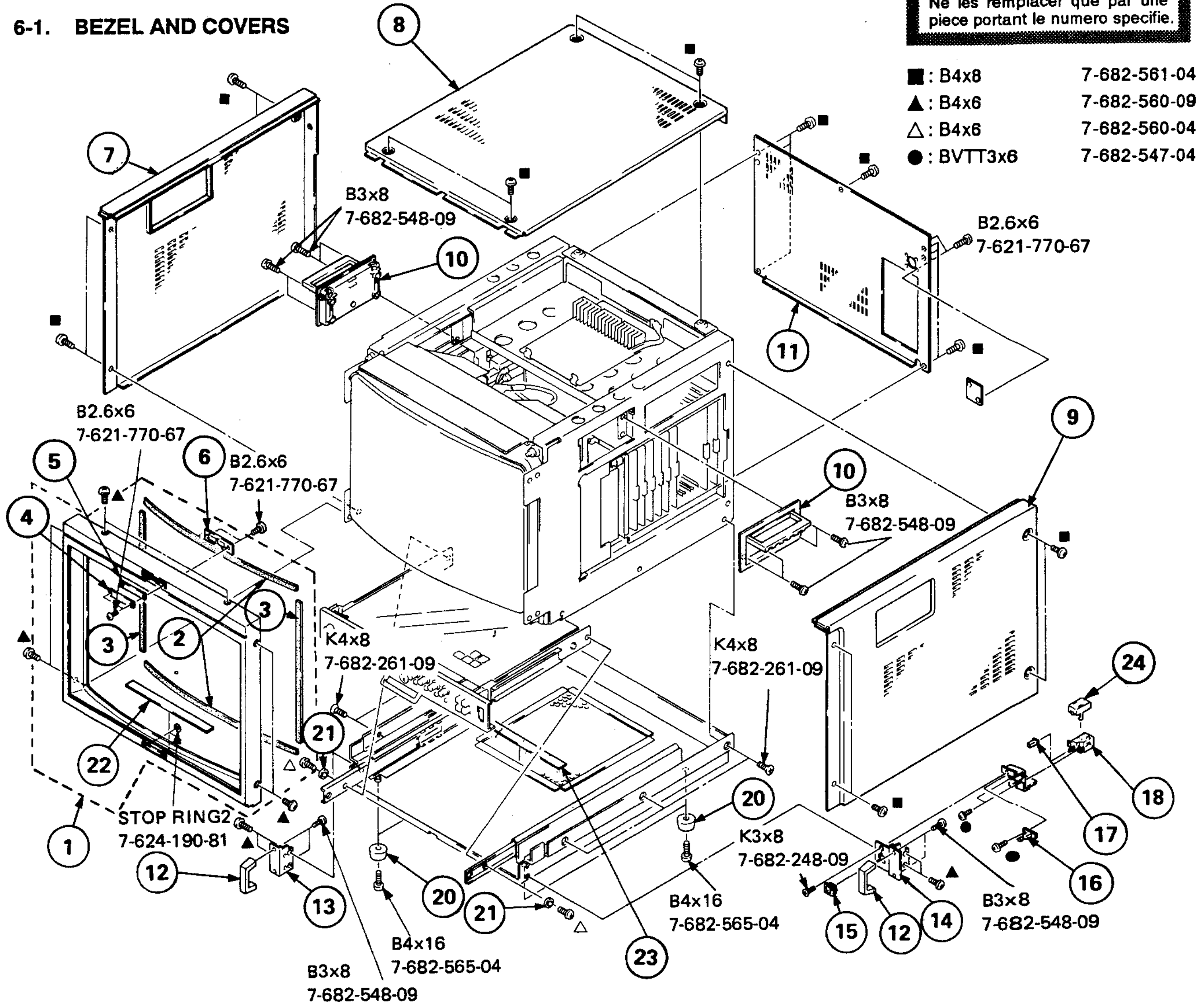
NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked " ∗ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

6-1. BEZEL AND COVERS



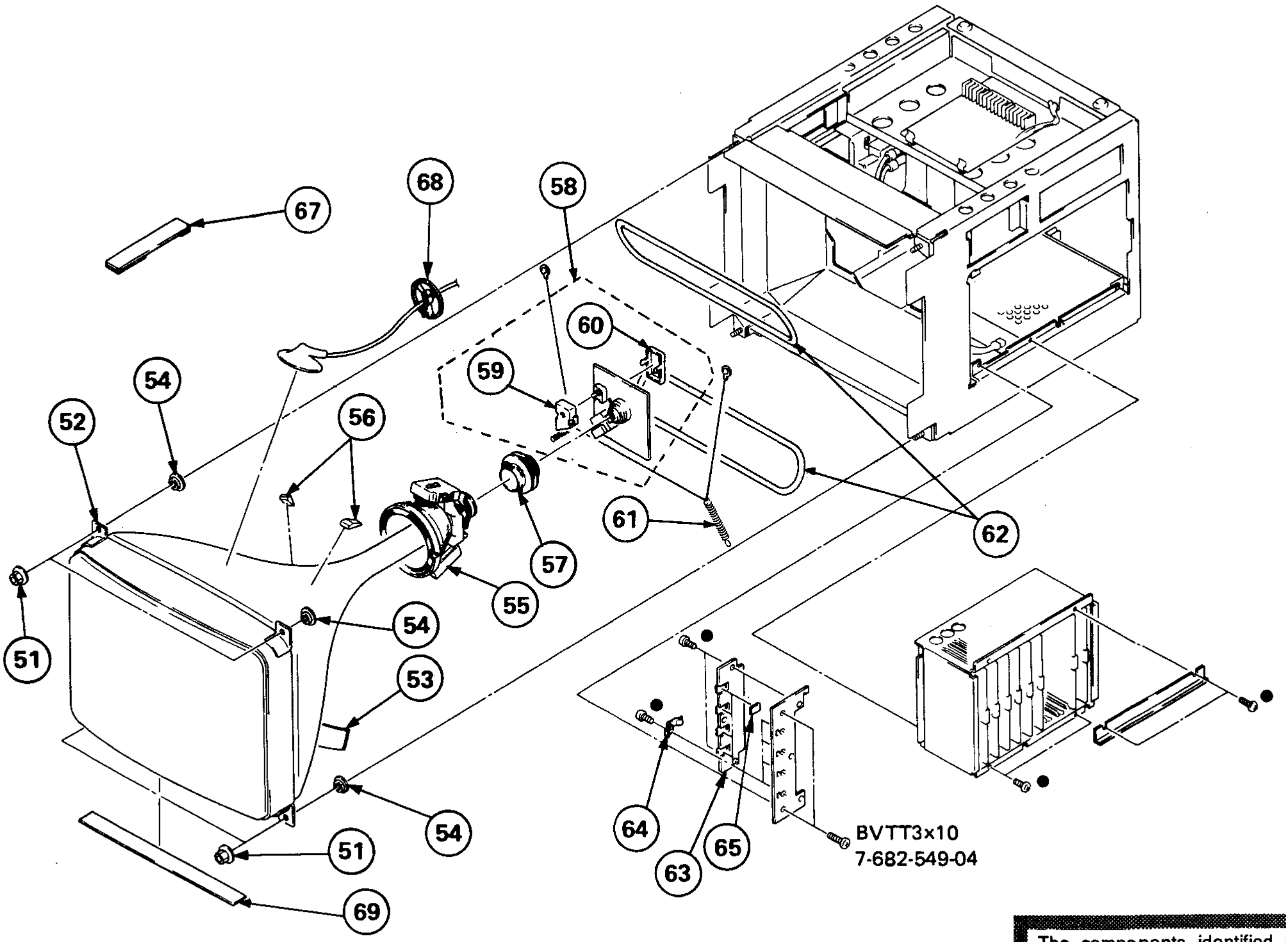
8
7
B3x8
7-682-548-09
10
11
B2.6x6
7-621-770-67
B2.6x6
7-621-770-67
5
6
B2.6x6
7-621-770-67
4
9
10
B3x8
7-682-548-09
3
3
2
K4x8
7-682-261-09
K4x8
7-682-261-09
24
21
22
STOP RING2
7-624-190-81
1
12
13
20
20
K3x8
7-682-248-09
18
17
16
B4x16
7-682-565-04
B3x8
7-682-548-09
21
15
12
14
B4x16
7-682-565-04
B3x8
7-682-548-09
23

■ : B4x8 7-682-561-04
▲ : B4x6 7-682-560-09
△ : B4x6 7-682-560-04
● : BVTT3x6 7-682-547-04

Ref. No.	Part No.	Description	Remark
1	X-4379-412-1	BEZEL ASSY	2, 3, 22
2	4-308-878-XX	CUSHION (A), CRT	
3	4-308-878-XX	CUSHION (B), BEZEL	
4	∗4-386-840-01	PLATE (B), TALLY	
5	∗4-386-839-01	PLATE, TALLY	
6	∗1-631-680-11	XB BOARD	
7	∗4-386-833-01	COVER (LEFT)	
8	∗4-386-831-01	COVER (UPPER)	
9	∗4-386-832-01	COVER (RIGHT)	
10	X-3642-018-0	HANDLE ASSY	
11	∗4-391-239-01	COVER, REAR	
12	∗4-353-706-00	HANDLE	
13	∗4-386-808-01	BRACKET (LEFT), HANDLE	
14	∗X-4379-408-1	PANEL ASSY, POWER SWITCH	
15	4-379-423-01	ESCUTCHEON (A)	
16	∗1-631-679-11	Y BOARD	
17	4-374-839-11	BUTTON (A)	
18	⚠ 1-571-877-11	SWITCH, PUSH (AC POWER)	
20	X-4836-202-9	FOOT	
21	∗4-379-499-01	SPACER	
22	3-831-441-11	CLOTH, BLOTTING	
23	4-372-556-01	SHEET, BLOTTING	
24	∗4-393-095-01	COVER, POWER SWITCH	

6-2. PICTURE TUBE

● : BVTT3x6 7-682-547-04



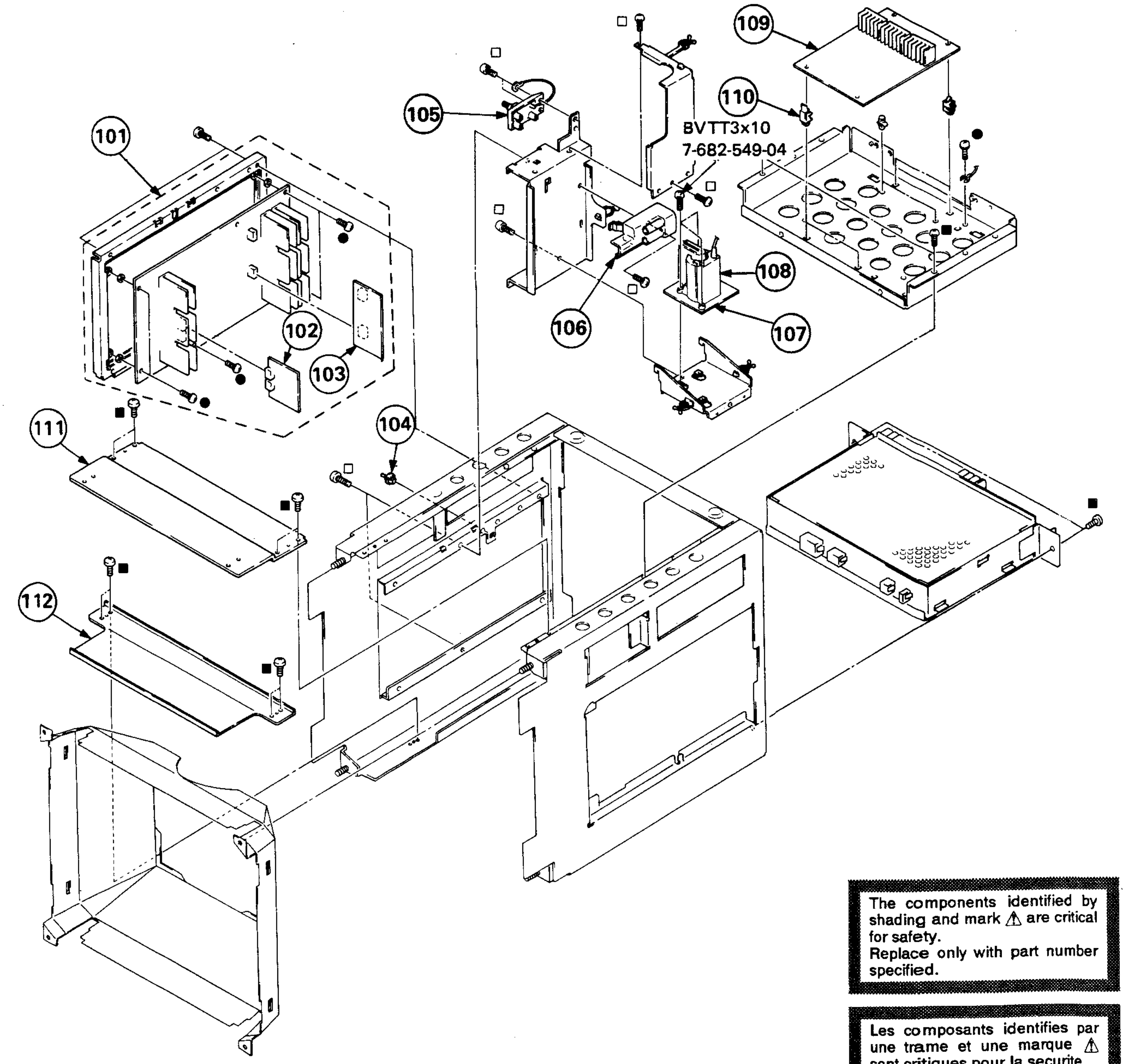
The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

Ref. No.	Part No.	Description	Remark
51	4-306-034-00	FLANGE NUT, (B) 5MM	
52	⚠ 8-736-121-05	PICTURE TUBE (M49KGH21X)(BVM-2015P, BVM-2015PM ONLY)	
	⚠ 8-736-123-05	PICTURE TUBE (M49KGH20X)(BVM-1915 ONLY)	
53	3-831-441-11	CLOTH, BLOTTING	
54	4-348-567-00	WASHER, PICTURE TUBE POSITION	
55	⚠ 1-451-349-21	DEFLECTION YOKE	
56	3-703-003-00	SPACER, DEFLECTION YOKE	
57	⚠ 1-452-337-22	NECK ASSY, PICTURE TUBE (NA304)	
58	*A-1331-020-A	C BOARD, COMPLETE	59, 60
59	*4-379-167-01	COVER (MAIN), CV	
60	*4-379-160-01	COVER (REAR LID), CV	
61	4-303-774-XX	SPRING	
62	⚠ 1-426-460-11	COIL, DEMAGNETIZATION	
63	*1-617-885-11	GC BOARD	
64	*4-363-404-00	HOLDER, IC	
65	4-370-970-01	SPACER, TR	
67	X-4309-608-0	PERMALLOY ASSY, CONVERGENCE	
68	*3-704-372-01	HOLDER, HV CABLE	
69	4-385-725-01	SHEET, BLOTTING	

6-3. CHASSIS

● : BVTT3x6	7-682-547-04
■ : B4x8	7-682-561-04
☐ : B3x8	7-682-548-09



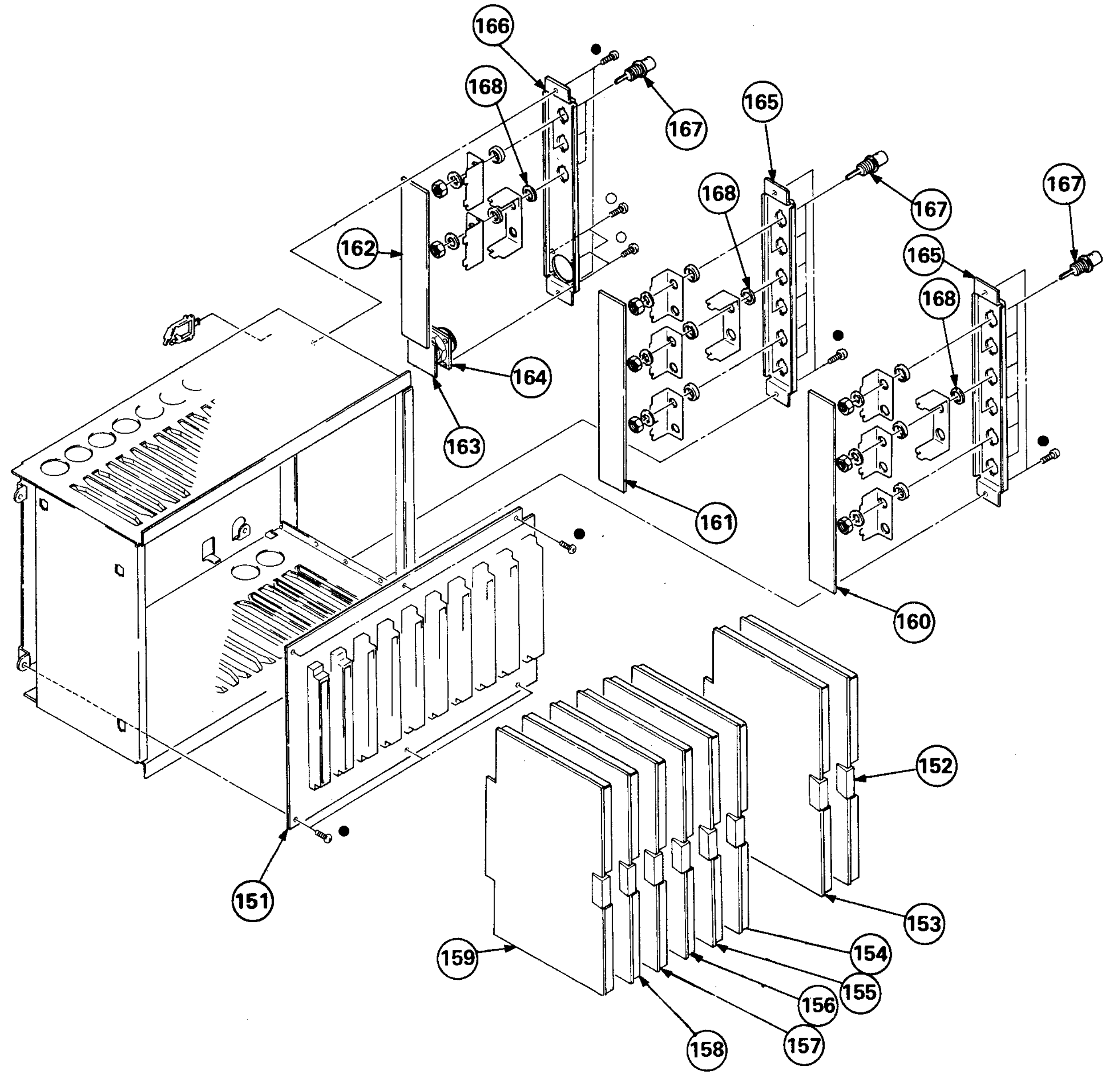
The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

Ref. No.	Part No.	Description	Remark
101	*A-1345-881-B	EA BOARD, COMPLETE	102, 103
102	*1-631-686-11	EC BOARD	
103	*1-631-685-11	EB BOARD	
104	*4-303-473-00	SUPPORT, PC	
105	⚠ 1-237-165-12	RESISTOR ASSY, HIGH-VOLTAGE	
106	⚠ 1-238-301-12	RESISTOR ASSY, HIGH-VOLTAGE	
107	*1-631-678-11	P BOARD	
108	⚠ 1-439-382-21	TRANSFORMER ASSY, FLYBACK	
109	*A-1135-523-A	BK BOARD, COMPLETE	
110	*3-703-141-00	HOLDER, PCB	
111	*4-386-819-02	STAY, FRONT	
112	*4-391-234-03	STAY, UNDER	

6-4. SIGNAL BLOCK

● : BVTT3x6 7-682-547-04
○ : BVTT3x6 7-682-547-09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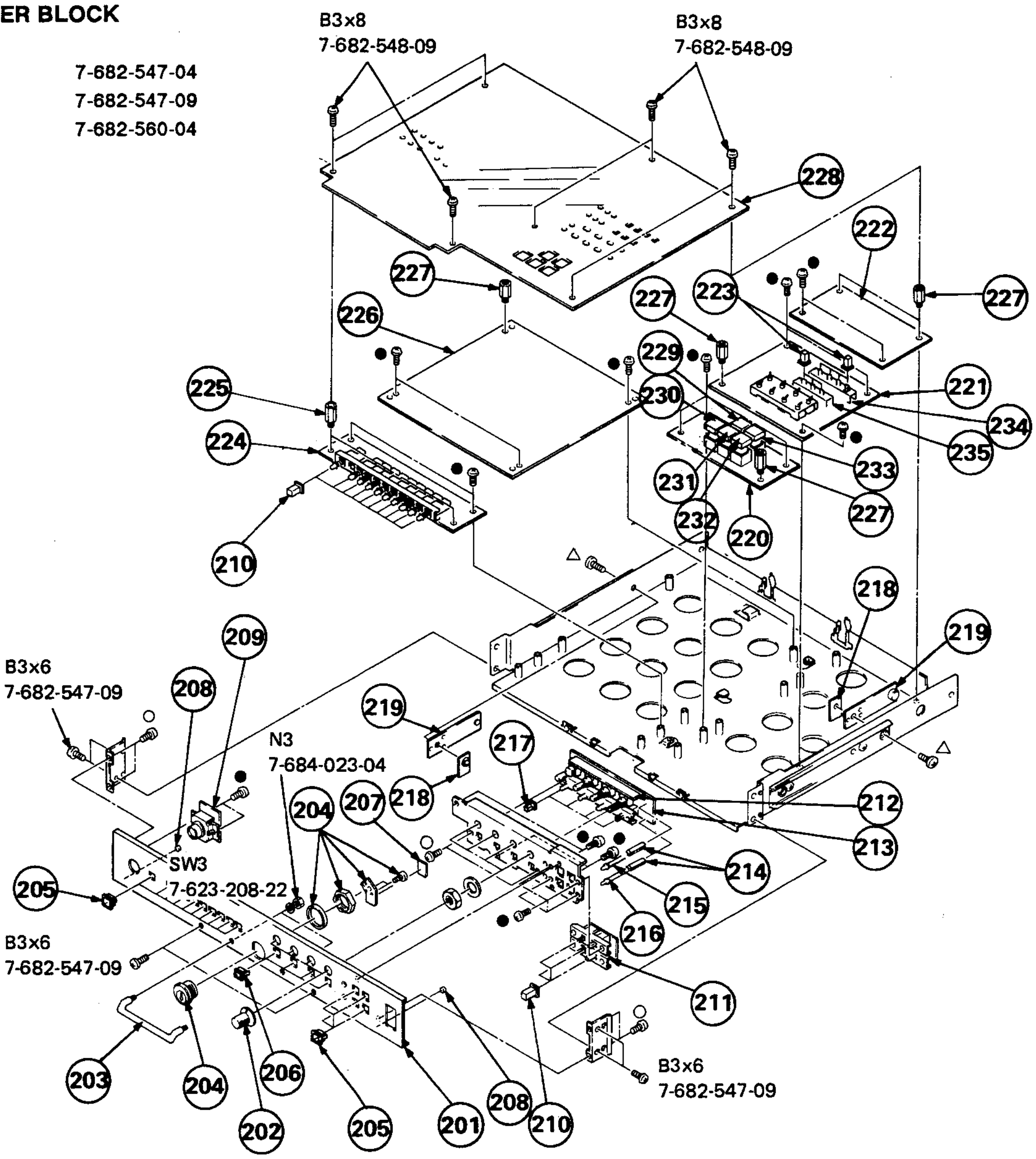
Ref. No.	Part No.	Description	Remark
151	*1-617-899-11	TB BOARD	
152	*A-1135-355-A	BA BOARD, COMPLETE	
153	*A-1135-606-B	BT BOARD, COMPLETE (BVM-1915 ONLY)	
154	*A-1135-391-A	BD BOARD, COMPLETE (BVM-2015P ONLY)	
	*A-1135-424-A	BM BOARD, COMPLETE (BVM-2015PM ONLY)	
155	*A-1135-357-A	BC BOARD, COMPLETE (BVM-1915 ONLY)	
156	*A-1135-537-A	BG BOARD, COMPLETE	
157	*A-1135-359-A	BH BOARD, COMPLETE	
158	*A-1135-591-A	BI BOARD, COMPLETE	
159	*A-1135-361-A	BJ BOARD, COMPLETE	
160	*1-617-895-11	QA BOARD	
161	*1-618-786-11	QB BOARD	
162	*1-627-678-11	W BOARD	
163	*1-627-677-11	V BOARD	
164	1-563-265-11	CONNECTOR, MULTIPLE 10P	
165	*4-379-439-01	PANEL (A), CONNECTOR	
166	*4-391-220-01	PANEL (C), CONNECTOR	
167	1-565-791-11	CONNECTOR, BNC 1P	
168	*4-379-404-01	INSULATOR, BNC	

6-5. DRAWER BLOCK

● : BVTT3x6 7-682-547-04
○ : BVTT3x6 7-682-547-09
△ : B4x6 7-682-560-04


B3x8
7-682-548-09
B3x8
7-682-548-09
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B3x6
7-682-547-09
208
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219
N3
7-684-023-04
217
204
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212
213
SW3
7-623-208-22
214
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215
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B3x6
7-682-547-09
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202
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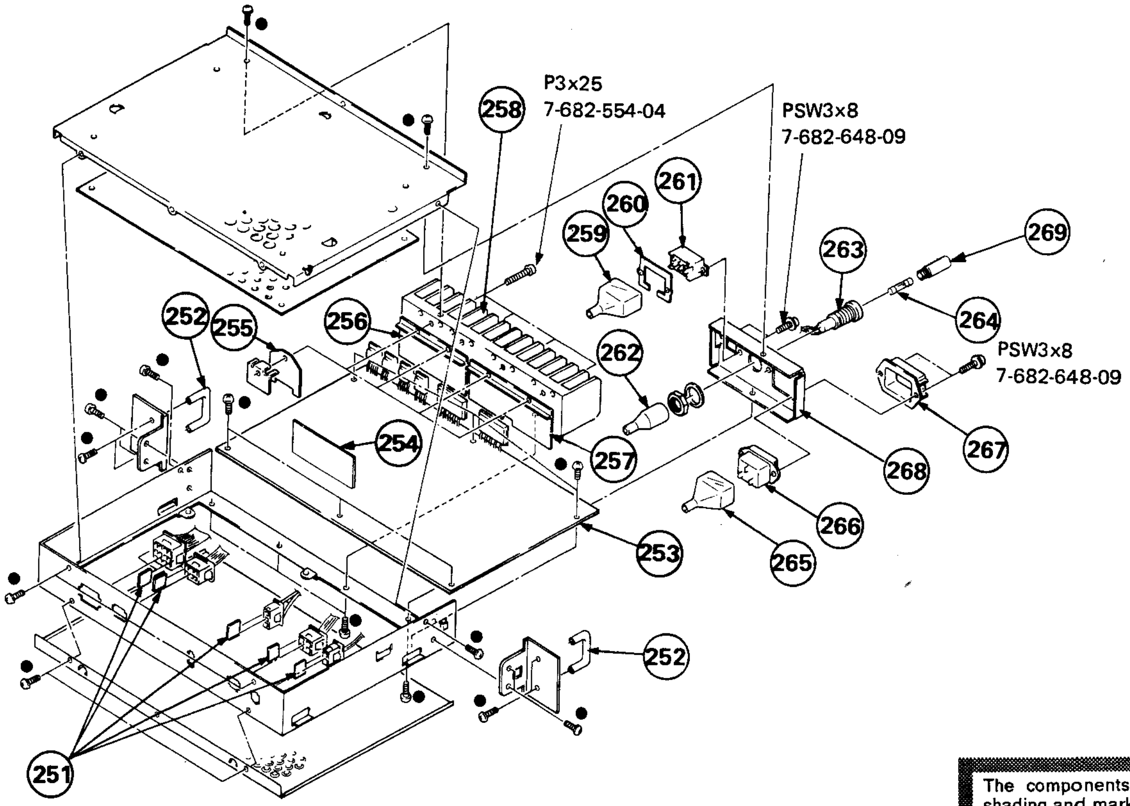
B3x6
7-682-547-09

Ref. No.	Part No.	Description	Remark
201	4-386-822-01	PANEL, CONTROL	
202	X-3673-635-0	KNOB (1) ASSY, CONTROL	
203	4-386-802-01	HANDLE, DRAWER	
204	4-378-917-01	LOCK, CYLINDER	
205	4-379-423-01	ESCUTCHEON (A)	
206	4-379-424-01	ESCUTCHEON (B)	
207	4-337-209-11	PROTECTOR, SCRATCH	
208	*4-911-672-01	FELT, COVER	
209	*1-623-001-11	HF BOARD	
210	4-374-839-01	BUTTON (A)	
211	*1-617-887-11	HC BOARD	
212	*1-627-682-11	HH BOARD	
213	*1-627-681-11	HG BOARD	
214	*4-026-910-00	HOLDER, LED	
215	8-719-812-41	DIODE TLR124	
216	8-719-938-68	DIODE TLY124	
217	4-379-422-01	BUTTON (B)	
218	*4-386-844-01	NUT, PLATE	
219	*X-4379-407-1	STOPPER ASSY	
220	*1-618-814-11	HE BOARD	
221	*1-627-680-11	HB BOARD	
222	*A-1345-884-A	DB BOARD, COMPLETE	
223	4-369-627-11	PUSH BUTTON	
224	*1-631-683-11	HA BOARD	
225	3-897-313-01	BOSS (17.2), RELAY	
226	*A-1345-882-A	DA BOARD, COMPLETE	
227	*2-264-136-00	SUPPORT, SWITCH, PUSH BUTTON	
228	*4-391-240-01	COVER PC BOARD	
229	4-379-004-01	KEY TOP	
230	4-379-004-11	KEY TOP	
231	4-379-004-41	KEY TOP	
232	4-379-004-31	KEY TOP	
233	4-379-004-21	KEY TOP	
234	1-570-568-11	SWITCH, PUSH (4 KEY)	
235	1-570-569-11	SWITCH, PUSH (3 KEY)	

6-6. POWER BLOCK

● : BVTT3x6 7-682-547-04


P3x25
7-682-554-04
PSW3x8
7-682-648-09
PSW3x8
7-682-648-09
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The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

Ref. No.	Part No.	Description	Remark
251	3-675-469-00	SPACER, SOLENOID	
252	4-379-421-01	HANDLE, DRAWER	
253	*A-1316-090-A	GA BOARD, COMPLETE (BVM-2015P ONLY)	254
	*A-1316-089-A	GA BOARD, COMPLETE (BVM-1915, BVM-2015M ONLY)	254
254	*1-627-679-11	GB BOARD	
255	*4-379-408-01	INSULATOR (G3)	
256	4-379-410-01	SPACER (G2), POLISHING	
257	4-379-403-01	SPACER (G1), POLISHING	
258	*4-347-706-00	HEAT SINK (TR)	
259	*4-371-879-02	COVER, AC SELECT	
260	*4-379-409-01	NUT, PLATE	
261	⚠ 1-570-173-22	SWITCH, VOLTAGE CHANGE	
262	*4-393-031-01	COVER, FUSE HOLDER	
263	⚠ 1-533-167-21	HOLDER, FUFSE	
264	⚠ 1-532-203-11	FUSE, TIME-LAG 2A/250V (BVM-2015P ONLY)	
	⚠ 1-532-746-11	FUSE, GLASS TUBE 4A/125V (BVM-1915, 2015PM ONLY)	
265	4-601-466-11	COVER, 3P INLET	
266	⚠ 1-580-375-11	3P INLET	
267	*2-990-241-01	HOLDER (A), PLUG	
268	*4-379-430-03	PANEL, POWER	
269	⚠ 1-533-168-21	HOLDER, FUSE	

SECTION 7
ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS
- All resistors are in ohms
- F : nonflammable

When indicating parts by reference number, please include the board name.

CAPACITORS
- MF : μF, PF : μμF

COILS
- MMH : mH, UH : μH

- The components identified by ⧓ in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

Ref.No	Part No.	Description			Remark
	*A-1135-355-A	BA BOARD, COMPLETE ***************			
	*4-353-708-00	HOOK, FINGER			
	*7-682-547-04	SCREW BVTT 3X6 (S)			
	*8-729-119-78	TRANSISTOR 2SC2785TP-E			
		CONNECTOR			
BA1	*1-566-054-11	PIN, CONNECTOR 2P			
BA2	*1-566-054-11	PIN, CONNECTOR 2P			
BA3	*1-566-054-11	PIN, CONNECTOR 2P			
BA4	*1-566-054-11	PIN, CONNECTOR 2P			
BA5	*1-566-054-11	PIN, CONNECTOR 2P			
BA6	*1-566-054-11	PIN, CONNECTOR 2P			
		CAPACITOR			
C1	1-124-910-11	ELECT	47MF	20%	16V
C2	1-124-910-11	ELECT	47MF	20%	16V
C3	1-124-910-11	ELECT	47MF	20%	16V
C4	1-123-356-00	ELECT	10MF	20%	16V
C5	1-124-910-11	ELECT	47MF	20%	16V
C6	1-124-910-11	ELECT	47MF	20%	16V
C7	1-124-910-11	ELECT	47MF	20%	16V
C8	1-124-910-11	ELECT	47MF	20%	16V
C9	1-101-004-00	CERAMIC	0.01MF		50V
C10	1-101-004-00	CERAMIC	0.01MF		50V
C11	1-124-119-00	ELECT	330MF	20%	16V
C12	1-123-356-00	ELECT	10MF	20%	16V
C13	1-123-356-00	ELECT	10MF	20%	16V
C14	1-123-356-00	ELECT	10MF	20%	16V
C15	1-123-356-00	ELECT	10MF	20%	16V
C16	1-123-356-00	ELECT	10MF	20%	16V
C17	1-123-356-00	ELECT	10MF	20%	16V
C18	1-123-356-00	ELECT	10MF	20%	16V
C19	1-123-356-00	ELECT	10MF	20%	16V
C20	1-101-004-00	CERAMIC	0.01MF		50V
C21	1-101-006-00	CERAMIC	0.047MF		50V
C31	1-101-004-00	CERAMIC	0.01MF		50V
C32	1-123-356-00	ELECT	10MF	20%	16V
C33	1-123-356-00	ELECT	10MF	20%	16V
C34	1-123-356-00	ELECT	10MF	20%	16V
C35	1-123-356-00	ELECT	10MF	20%	16V
C36	1-123-356-00	ELECT	10MF	20%	16V
C37	1-123-356-00	ELECT	10MF	20%	16V
C38	1-123-356-00	ELECT	10MF	20%	16V
C39	1-101-004-00	CERAMIC	0.01MF		50V
C51	1-124-119-00	ELECT	330MF	20%	16V
C52	1-123-356-00	ELECT	10MF	20%	16V
C53	1-123-356-00	ELECT	10MF	20%	16V
C54	1-123-356-00	ELECT	10MF	20%	16V
C55	1-123-356-00	ELECT	10MF	20%	16V
C56	1-123-356-00	ELECT	10MF	20%	16V
C57	1-123-356-00	ELECT	10MF	20%	16V
C71	1-101-004-00	CERAMIC	0.01MF		50V
C72	1-101-004-00	CERAMIC	0.01MF		50V
C74	1-101-004-00	CERAMIC	0.01MF		50V
C75	1-101-004-00	CERAMIC	0.01MF		50V
C76	1-101-004-00	CERAMIC	0.01MF		50V
C77	1-101-004-00	CERAMIC	0.01MF		50V
C101	1-102-038-00	CERAMIC	0.001MF		500V
C102	1-123-356-00	ELECT	10MF	20%	16V
C103	1-102-951-00	CERAMIC	15PF	5%	50V
C104	1-123-379-00	ELECT	0.47MF	20%	50V
C201	1-102-038-00	CERAMIC	0.001MF		500V
C202	1-123-356-00	ELECT	10MF	20%	16V
C203	1-102-951-00	CERAMIC	15PF	5%	50V
C204	1-123-379-00	ELECT	0.47MF	20%	50V
C301	1-102-038-00	CERAMIC	0.001MF		500V
C302	1-123-356-00	ELECT	10MF	20%	16V
C303	1-102-965-00	CERAMIC	39PF	5%	50V
C304	1-123-379-00	ELECT	0.47MF	20%	50V
C305	1-102-947-00	CERAMIC	10PF	0.5PF	50V
C306	1-102-942-00	CERAMIC	5PF	1PF	50V
C401	1-102-038-00	CERAMIC	0.001MF		500V
C402	1-123-356-00	ELECT	10MF	20%	16V
C403	1-102-951-00	CERAMIC	15PF	5%	50V
C404	1-123-379-00	ELECT	0.47MF	20%	50V
C501	1-102-038-00	CERAMIC	0.001MF		500V
C502	1-123-356-00	ELECT	10MF	20%	16V
C503	1-102-951-00	CERAMIC	15PF	5%	50V
C504	1-123-379-00	ELECT	0.47MF	20%	50V
C601	1-102-038-00	CERAMIC	0.001MF		500V
C602	1-123-356-00	ELECT	10MF	20%	16V
C603	1-102-951-00	CERAMIC	15PF	5%	50V
C604	1-123-379-00	ELECT	0.47MF	20%	50V
C701	1-102-976-00	CERAMIC	180PF	5%	50V
C702	1-102-947-00	CERAMIC	10PF	0.5PF	50V
C703	1-123-356-00	ELECT	10MF	20%	16V
C704	1-124-910-11	ELECT	47MF	20%	16V
C705	1-136-153-00	FILM	0.01MF	5%	50V
C706	1-123-380-00	ELECT	1MF	20%	50V
C707	1-123-369-00	ELECT	4.7MF	20%	25V
C708	1-123-356-00	ELECT	10MF	20%	16V
C709	1-102-973-00	CERAMIC	100PF	5%	50V
C710	1-130-481-00	MYLAR	0.0068MF	5%	50V
C711	1-136-155-00	FILM	0.015MF	5%	50V
C712	1-130-471-00	MYLAR	0.001MF	5%	50V
C713	1-123-380-00	ELECT	1MF	20%	50V
C714	1-102-973-00	CERAMIC	100PF	5%	50V
C715	1-101-361-00	CERAMIC	150PF	5%	50V
C716	1-136-153-00	FILM	0.01MF	5%	50V
C717	1-102-973-00	CERAMIC	100PF	5%	50V
		VARIABLE CAPACITOR			
CV101	1-141-179-12	CAP, VAR, TRIMMER			
CV102	1-141-260-00	TRIMAR, CERAMIC			
CV201	1-141-179-12	CAP, VAR, TRIMMER			
CV202	1-141-260-00	TRIMAR, CERAMIC			
CV401	1-141-179-12	CAP, VAR, TRIMMER			

BA

Ref.No	Part No.	Description	Remark
CV402	1-141-260-00	TRIMAR, CERAMIC	
CV501	1-141-179-12	CAP, VAR, TRIMMER	
CV502	1-141-260-00	TRIMAR, CERAMIC	
CV601	1-141-179-12	CAP, VAR, TRIMMER	
CV602	1-141-260-00	TRIMAR, CERAMIC	

DIODE

Ref.No	Part No.	Description	Remark
D1	8-719-109-63	DIODE RD3.0ES-B2	
D2	8-719-000-06	DIODE MC921	
D4	8-719-000-04	DIODE MC911	
D701	8-719-911-19	DIODE 1SS119	
D702	8-719-109-75	DIODE RD4.3ES-B2	
D703	8-719-911-19	DIODE 1SS119	
D704	8-719-911-19	DIODE 1SS119	
D705	8-719-911-19	DIODE 1SS119	
D706	8-719-911-19	DIODE 1SS119	
D707	8-719-911-19	DIODE 1SS119	
D708	8-719-911-19	DIODE 1SS119	
D709	8-719-911-19	DIODE 1SS119	
D710	8-719-911-19	DIODE 1SS119	

IC

Ref.No	Part No.	Description	Remark
IC1	8-759-208-94	IC CX-894	
IC2	8-759-208-94	IC CX-894	
IC3	8-759-140-53	IC MC14053BCP	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q1	8-729-900-89	TRANSISTOR DTC144ES	
Q2	8-729-384-48	TRANSISTOR 2SA844-E	
Q3	8-729-900-89	TRANSISTOR DTC144ES	
Q4	8-729-900-89	TRANSISTOR XDC144ES	
Q5	8-729-900-89	TRANSISTOR DTC144ES	
Q6	8-729-926-33	TRANSISTOR XDA144ES	
Q101	8-729-266-82	TRANSISTOR 2SC2668-O	
Q102	8-729-266-82	TRANSISTOR 2SC2668-O	
Q103	8-729-266-82	TRANSISTOR 2SC2668-O	
Q104	8-729-384-48	TRANSISTOR 2SA844-E	
Q105	8-729-266-82	TRANSISTOR 2SC2668-O	
Q201	8-729-266-82	TRANSISTOR 2SC2668-O	
Q202	8-729-266-82	TRANSISTOR 2SC2668-O	
Q203	8-729-266-82	TRANSISTOR 2SC2668-O	
Q204	8-729-384-48	TRANSISTOR 2SA844-E	
Q205	8-729-266-82	TRANSISTOR 2SC2668-O	
Q301	8-729-266-82	TRANSISTOR 2SC2668-O	
Q302	8-729-266-82	TRANSISTOR 2SC2668-O	
Q303	8-729-266-82	TRANSISTOR 2SC2668-O	
Q304	8-729-384-48	TRANSISTOR 2SA844-E	
Q305	8-729-266-82	TRANSISTOR 2SC2668-O	
Q401	8-729-266-82	TRANSISTOR 2SC2668-O	
Q402	8-729-266-82	TRANSISTOR 2SC2668-O	
Q403	8-729-266-82	TRANSISTOR 2SC2668-O	
Q404	8-729-384-48	TRANSISTOR 2SA844-E	
Q405	8-729-266-82	TRANSISTOR 2SC2668-O	
Q501	8-729-266-82	TRANSISTOR 2SC2668-O	
Q502	8-729-266-82	TRANSISTOR 2SC2668-O	
Q503	8-729-266-82	TRANSISTOR 2SC2668-O	
Q504	8-729-384-48	TRANSISTOR 2SA844-E	
Q505	8-729-266-82	TRANSISTOR 2SC2668-O	
Q601	8-729-266-82	TRANSISTOR 2SC2668-O	
Q602	8-729-266-82	TRANSISTOR 2SC2668-O	
Q603	8-729-266-82	TRANSISTOR 2SC2668-O	
Q604	8-729-384-48	TRANSISTOR 2SA844-E	
Q605	8-729-266-82	TRANSISTOR 2SC2668-O	
Q701	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q702	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q703	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q704	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q705	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q706	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q707	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q708	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q709	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q710	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q711	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q712	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q713	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q714	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q715	8-729-800-10	TRANSISTOR 2SC3068	
Q716	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q717	8-729-119-76	TRANSISTOR 2SA1175-HFE	

RESISTOR

Ref.No	Part No.	Description				Remark
R1	1-249-405-11	CARBON	100	5%	1/4W	
R2	1-249-405-11	CARBON	100	5%	1/4W	
R3	1-249-405-11	CARBON	100	5%	1/4W	
R4	1-249-437-11	CARBON	47K	5%	1/4W	
R5	1-249-405-11	CARBON	100	5%	1/4W	
R6	1-249-432-11	CARBON	18K	5%	1/4W	
R7	1-249-434-11	CARBON	27K	5%	1/4W	
R8	1-249-422-11	CARBON	2.7K	5%	1/4W	
R9	1-249-405-11	CARBON	100	5%	1/4W	
R10	1-249-405-11	CARBON	100	5%	1/4W	
R11	1-249-433-11	CARBON	22K	5%	1/4W	
R12	1-249-405-11	CARBON	100	5%	1/4W	
R13	1-249-437-11	CARBON	47K	5%	1/4W	
R14	1-249-429-11	CARBON	10K	5%	1/4W	
R101	1-249-417-11	CARBON	1K	5%	1/4W	
R102	1-249-418-11	CARBON	1.2K	5%	1/4W	
R103	1-249-425-11	CARBON	4.7K	5%	1/4W	
R104	1-249-405-11	CARBON	100	5%	1/4W	
R105	1-215-437-00	METAL	4.7K	1%	1/4W	
R106	1-249-430-11	CARBON	12K	5%	1/4W	
R107	1-249-433-11	CARBON	22K	5%	1/4W	
R108	1-215-427-00	METAL	1.8K	1%	1/4W	
R109	1-215-415-00	METAL	560	1%	1/4W	
R110	1-249-405-11	CARBON	100	5%	1/4W	
R111	1-215-431-00	METAL	2.7K	1%	1/4W	
R112	1-249-421-11	CARBON	2.2K	5%	1/4W	
R113	1-249-393-11	CARBON	10	5%	1/4W	
R201	1-249-417-11	CARBON	1K	5%	1/4W	
R202	1-249-418-11	CARBON	1.2K	5%	1/4W	
R203	1-249-425-11	CARBON	4.7K	5%	1/4W	
R204	1-249-405-11	CARBON	100	5%	1/4W	
R205	1-215-437-00	METAL	4.7K	1%	1/4W	
R206	1-249-430-11	CARBON	12K	5%	1/4W	
R207	1-249-433-11	CARBON	22K	5%	1/4W	
R208	1-215-427-00	METAL	1.8K	1%	1/4W	
R209	1-215-415-00	METAL	560	1%	1/4W	
R210	1-249-405-11	CARBON	100	5%	1/4W	
R211	1-215-431-00	METAL	2.7K	1%	1/4W	
R212	1-249-421-11	CARBON	2.2K	5%	1/4W	
R213	1-249-393-11	CARBON	10	5%	1/4W	
R301	1-249-417-11	CARBON	1K	5%	1/4W	
R302	1-249-418-11	CARBON	1.2K	5%	1/4W	
R303	1-249-426-11	CARBON	5.6K	5%	1/4W	
R304	1-249-405-11	CARBON	100	5%	1/4W	
R305	1-249-426-11	CARBON	5.6K	5%	1/4W	
R306	1-249-430-11	CARBON	12K	5%	1/4W	
R307	1-249-432-11	CARBON	18K	5%	1/4W	
R308	1-249-421-11	CARBON	2.2K	5%	1/4W	
R309	1-249-417-11	CARBON	1K	5%	1/4W	
R310	1-249-405-11	CARBON	100	5%	1/4W	

Ref.No	Part No.	Description			Remark
R311	1-249-417-11	CARBON	1K	5%	1/4W
R312	1-249-421-11	CARBON	2.2K	5%	1/4W
R313	1-249-393-11	CARBON	10	5%	1/4W
R401	1-249-417-11	CARBON	1K	5%	1/4W
R402	1-249-418-11	CARBON	1.2K	5%	1/4W
R403	1-249-425-11	CARBON	4.7K	5%	1/4W
R404	1-249-405-11	CARBON	100	5%	1/4W
R405	1-215-437-00	METAL	4.7K	1%	1/4W
R406	1-249-430-11	CARBON	12K	5%	1/4W
R407	1-249-433-11	CARBON	22K	5%	1/4W
R408	1-215-427-00	METAL	1.8K	1%	1/4W
R409	1-215-415-00	METAL	560	1%	1/4W
R410	1-249-405-11	CARBON	100	5%	1/4W
R411	1-215-431-00	METAL	2.7K	1%	1/4W
R412	1-249-421-11	CARBON	2.2K	5%	1/4W
R413	1-249-393-11	CARBON	10	5%	1/4W
R501	1-249-417-11	CARBON	1K	5%	1/4W
R502	1-249-418-11	CARBON	1.2K	5%	1/4W
R503	1-249-425-11	CARBON	4.7K	5%	1/4W
R504	1-249-405-11	CARBON	100	5%	1/4W
R505	1-215-437-00	METAL	4.7K	1%	1/4W
R506	1-249-430-11	CARBON	12K	5%	1/4W
R507	1-249-433-11	CARBON	22K	5%	1/4W
R508	1-215-427-00	METAL	1.8K	1%	1/4W
R509	1-215-415-00	METAL	560	1%	1/4W
R510	1-249-405-11	CARBON	100	5%	1/4W
R511	1-215-431-00	METAL	2.7K	1%	1/4W
R512	1-249-421-11	CARBON	2.2K	5%	1/4W
R513	1-249-393-11	CARBON	10	5%	1/4W
R601	1-249-417-11	CARBON	1K	5%	1/4W
R602	1-249-418-11	CARBON	1.2K	5%	1/4W
R603	1-249-425-11	CARBON	4.7K	5%	1/4W
R604	1-249-405-11	CARBON	100	5%	1/4W
R605	1-215-437-00	METAL	4.7K	1%	1/4W
R606	1-249-430-11	CARBON	12K	5%	1/4W
R607	1-249-433-11	CARBON	22K	5%	1/4W
R608	1-215-427-00	METAL	1.8K	1%	1/4W
R609	1-215-415-00	METAL	560	1%	1/4W
R610	1-249-405-11	CARBON	100	5%	1/4W
R611	1-215-431-00	METAL	2.7K	1%	1/4W
R612	1-249-421-11	CARBON	2.2K	5%	1/4W
R613	1-249-393-11	CARBON	10	5%	1/4W
R701	1-249-433-11	CARBON	22K	5%	1/4W
R702	1-249-438-11	CARBON	56K	5%	1/4W
R703	1-249-417-11	CARBON	1K	5%	1/4W
R704	1-249-417-11	CARBON	1K	5%	1/4W
R705	1-249-424-11	CARBON	3.9K	5%	1/4W
R706	1-249-417-11	CARBON	1K	5%	1/4W
R707	1-249-429-11	CARBON	10K	5%	1/4W
R708	1-249-421-11	CARBON	2.2K	5%	1/4W
R709	1-249-419-11	CARBON	1.5K	5%	1/4W
R710	1-249-418-11	CARBON	1.2K	5%	1/4W
R711	1-249-434-11	CARBON	27K	5%	1/4W
R712	1-249-433-11	CARBON	22K	5%	1/4W
R713	1-249-422-11	CARBON	2.7K	5%	1/4W
R714	1-249-427-11	CARBON	6.8K	5%	1/4W
R715	1-249-433-11	CARBON	22K	5%	1/4W
R716	1-249-422-11	CARBON	2.7K	5%	1/4W
R717	1-249-425-11	CARBON	4.7K	5%	1/4W
R718	1-249-410-11	CARBON	270	5%	1/4W
R719	1-249-414-11	CARBON	560	5%	1/4W
R720	1-247-850-11	CARBON	6.2K	5%	1/4W
R721	1-249-438-11	CARBON	56K	5%	1/4W
R722	1-249-441-11	CARBON	100K	5%	1/4W
R723	1-249-437-11	CARBON	47K	5%	1/4W

Ref.No	Part No.	Description			Remark
R724	1-249-429-11	CARBON	10K	5%	1/4W
R725	1-249-438-11	CARBON	56K	5%	1/4W
R726	1-247-895-00	CARBON	470K	5%	1/4W
R727	1-249-425-11	CARBON	4.7K	5%	1/4W
R728	1-249-435-11	CARBON	33K	5%	1/4W
R729	1-249-423-11	CARBON	3.3K	5%	1/4W
R730	1-249-421-11	CARBON	2.2K	5%	1/4W
R731	1-249-422-11	CARBON	2.7K	5%	1/4W
R732	1-249-422-11	CARBON	2.7K	5%	1/4W
R733	1-249-421-11	CARBON	2.2K	5%	1/4W
R734	1-249-421-11	CARBON	2.2K	5%	1/4W
R735	1-249-421-11	CARBON	2.2K	5%	1/4W
R736	1-249-425-11	CARBON	4.7K	5%	1/4W
R737	1-249-405-11	CARBON	100	5%	1/4W
R738	1-249-441-11	CARBON	100K	5%	1/4W
R739	1-249-433-11	CARBON	22K	5%	1/4W
R740	1-249-417-11	CARBON	1K	5%	1/4W
R741	1-202-473-00	SOLID	5.6M	5%	1/4W

VARIABLE RESISTOR

RV101	1-237-514-21	RES, ADJ, CERMET 500
RV201	1-237-514-21	RES, ADJ, CERMET 500
RV401	1-237-514-21	RES, ADJ, CERMET 500
RV501	1-237-514-21	RES, ADJ, CERMET 500
RV601	1-237-514-21	RES, ADJ, CERMET 500

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*A-1135-357-A BC BOARD, COMPLETE

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*4-353-708-00	HOOK, FINGER
7-682-547-04	SCREW BVTT 3X6 (S)
7-682-950-01	SCREW PSW 3X12

CAPACITOR

C1	1-102-951-00	CERAMIC	15PF	5%	50V
C2	1-102-951-00	CERAMIC	15PF	5%	50V
C3	1-102-947-00	CERAMIC	10PF	0.5PF	50V
C4	1-101-880-00	CERAMIC	47PF	5%	50V
C5	1-102-965-00	CERAMIC	39PF	5%	50V
C6	1-101-004-00	CERAMIC	0.01MF		50V
C7	1-102-935-00	CERAMIC	2PF	0.25PF	50V
C8	1-101-361-00	CERAMIC	39PF	5%	50V
C9	1-123-356-00	ELECT	10MF	20%	16V
C10	1-123-356-00	ELECT	10MF	20%	16V
C11	1-101-004-00	CERAMIC	0.01MF		50V
C12	1-101-004-00	CERAMIC	0.01MF		50V
C13	1-101-004-00	CERAMIC	0.01MF		50V
C14	1-101-004-00	CERAMIC	0.01MF		50V
C15	1-124-910-11	ELECT	47MF	20%	16V
C16	1-124-910-11	ELECT	47MF	20%	16V
C17	1-124-034-51	ELECT	33MF	20%	16V
C18	1-101-004-00	CERAMIC	0.01MF		50V
C19	1-102-953-00	CERAMIC	18PF	5%	50V
C20	1-102-951-00	CERAMIC	15PF	5%	50V
C22	1-101-884-00	CERAMIC	56PF	5%	50V
C23	1-123-369-00	ELECT	4.7MF	20%	25V
C24	1-163-157-00	FILM	0.022MF	5%	50V
C25	1-163-157-00	FILM	0.022MF	5%	50V
C26	1-101-004-00	CERAMIC	0.01MF		50V
C27	1-101-004-00	CERAMIC	0.01MF		50V
C28	1-123-379-00	ELECT	0.47MF	20%	50V
C29	1-101-004-00	CERAMIC	0.01MF		50V
C30	1-101-004-00	CERAMIC	0.01MF		50V
C31	1-124-119-00	ELECT	330MF	20%	16V

BC

Ref.No	Part No.	Description			Remark
C34	1-109-676-00	MICA	130PF	1%	500V
C35	1-109-631-00	MICA	330PF	1%	500V
C36	1-102-960-00	CERAMIC	24PF	5%	50V
C39	1-109-676-00	MICA	130PF	1%	500V
C40	1-109-631-00	MICA	330PF	1%	500V
C41	1-102-960-00	CERAMIC	24PF	5%	50V
C42	1-101-004-00	CERAMIC	0.01MF		50V
C50	1-102-942-00	CERAMIC	5PF	0.5PF	50V
C101	1-124-034-51	ELECT	33MF	20%	16V
C102	1-101-004-00	CERAMIC	0.01MF		50V
C103	1-124-917-11	ELECT	33MF	20%	25V
C104	1-124-034-51	ELECT	33MF	20%	16V
C105	1-101-004-00	CERAMIC	0.01MF		50V
C106	1-124-917-11	ELECT	33MF	20%	25V
C107	1-101-004-00	CERAMIC	0.01MF		50V
C111	1-124-034-51	ELECT	33MF	20%	16V
C112	1-124-034-51	ELECT	33MF	20%	16V
C113	1-124-034-51	ELECT	33MF	20%	16V
C116	1-101-004-00	CERAMIC	0.01MF		50V
C117	1-101-004-00	CERAMIC	0.01MF		50V
C118	1-101-004-00	CERAMIC	0.01MF		50V
C121	1-124-034-51	ELECT	33MF	20%	16V
C122	1-124-034-51	ELECT	33MF	20%	16V
C123	1-124-034-51	ELECT	33MF	20%	16V
C126	1-101-004-00	CERAMIC	0.01MF		50V
C127	1-101-004-00	CERAMIC	0.01MF		50V
C128	1-101-004-00	CERAMIC	0.01MF		50V
C131	1-124-034-51	ELECT	33MF	20%	16V
C132	1-124-034-51	ELECT	33MF	20%	16V
C133	1-124-034-51	ELECT	33MF	20%	16V
C136	1-101-004-00	CERAMIC	0.01MF		50V
C137	1-101-004-00	CERAMIC	0.01MF		50V
C138	1-101-004-00	CERAMIC	0.01MF		50V
C139	1-101-004-00	CERAMIC	0.01MF		50V
C143	1-101-004-00	CERAMIC	0.01MF		50V
C144	1-123-330-00	ELECT	22MF	20%	25V
C201	1-124-917-11	ELECT	33MF	20%	25V
C202	1-101-004-00	CERAMIC	0.01MF		50V

VARIABLE CAPACITOR

CV1	1-141-171-00	CAP,TRIMMER 15P
CV2	1-141-171-00	CAP,TRIMMER 15P

DIODE

D1	8-719-911-19	DIODE 1SS119
D2	8-719-920-95	DIODE 1T25-0
D3	8-719-911-19	DIODE 1SS119
D4	8-719-110-13	DIODE RD9.1ES-B2
D5	8-719-911-19	DIODE 1SS119
D6	8-719-911-19	DIODE 1SS119
D7	8-719-911-19	DIODE 1SS119

IC

IC1	8-759-204-21	IC TA7193P
IC2	8-752-006-12	IC CX20061
IC3	8-759-140-53	IC MC14053BCP

COIL

L1	1-408-533-00	COIL, VARIABLE	
L2	1-408-513-00	COIL (VARIABLE)	
L3	1-408-533-00	COIL, VARIABLE	
L4	1-408-429-00	INDUCTOR	470UH
L5	1-408-429-00	INDUCTOR	470UH
L6	1-408-429-00	INDUCTOR	470UH

Ref.No	Part No.	Description	Remark

TRANSISTOR

Q1	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q2	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q3	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q4	8-729-800-10	TRANSISTOR 2SC3068
Q5	8-729-800-10	TRANSISTOR 2SC3068
Q6	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q7	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q8	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q9	8-729-384-48	TRANSISTOR 2SA844-E
Q10	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q11	8-729-384-48	TRANSISTOR 2SA844-E
Q12	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q13	8-729-384-48	TRANSISTOR 2SA844-E
Q14	8-729-384-48	TRANSISTOR 2SA844-E
Q15	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q16	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q17	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q18	8-729-800-10	TRANSISTOR 2SC3068
Q19	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q20	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q21	8-729-800-10	TRANSISTOR 2SC3068
Q101	8-729-140-97	TRANSISTOR 2SB734-34
Q103	8-729-926-40	TRANSISTOR DTA124ES
Q104	8-729-926-40	TRANSISTOR XDA124ES

RESISTOR

R1	1-249-428-11	CARBON	8.2K	5%	1/4W
R2	1-249-429-11	CARBON	10K	5%	1/4W
R3	1-249-405-11	CARBON	100	5%	1/4W
R4	1-249-422-11	CARBON	2.7K	5%	1/4W
R5	1-215-421-00	METAL	1K	1%	1/4W
R6	1-215-398-00	METAL	110	1%	1/4W
R7	1-249-405-11	CARBON	100	5%	1/4W
R8	1-215-421-00	METAL	1K	1%	1/4W
R9	1-215-421-00	METAL	1K	1%	1/4W
R10	1-215-423-00	METAL	1.2K	1%	1/4W
R11	1-249-405-11	CARBON	100	5%	1/4W
R12	1-215-425-00	METAL	1.5K	1%	1/4W
R13	1-215-425-00	METAL	1.5K	1%	1/4W
R14	1-215-405-00	METAL	220	1%	1/4W
R15	1-249-405-11	CARBON	100	5%	1/4W
R16	1-249-433-11	CARBON	22K	5%	1/4W
R17	1-249-433-11	CARBON	22K	5%	1/4W
R18	1-249-421-11	CARBON	2.2K	5%	1/4W
R19	1-249-425-11	CARBON	4.7K	5%	1/4W
R20	1-249-429-11	CARBON	10K	5%	1/4W
R22	1-249-429-11	CARBON	10K	5%	1/4W
R23	1-249-431-11	CARBON	15K	5%	1/4W
R24	1-249-428-11	CARBON	8.2K	5%	1/4W
R25	1-249-405-11	CARBON	100	5%	1/4W
R26	1-249-417-11	CARBON	1K	5%	1/4W
R27	1-249-405-11	CARBON	100	5%	1/4W
R28	1-249-417-11	CARBON	1K	5%	1/4W
R29	1-249-405-11	CARBON	100	5%	1/4W
R30	1-249-425-11	CARBON	4.7K	5%	1/4W
R31	1-249-425-11	CARBON	4.7K	5%	1/4W
R32	1-249-433-11	CARBON	22K	5%	1/4W
R33	1-249-405-11	CARBON	100	5%	1/4W
R34	1-215-425-00	METAL	1.5K	1%	1/4W
R35	1-215-425-00	METAL	1.5K	1%	1/4W
R36	1-215-425-00	METAL	1.5K	1%	1/4W
R37	1-215-425-00	METAL	1.5K	1%	1/4W
R38	1-215-439-00	METAL	5.6K	1%	1/4W
R39	1-215-469-00	METAL	100K	1%	1/4W

Ref.No	Part No.	Description			Remark
R40	1-247-903-00	CARBON	1M	5%	1/4W
R41	1-249-427-11	CARBON	6.8K	5%	1/4W
R42	1-249-420-11	CARBON	1.8K	5%	1/4W
R43	1-249-415-11	CARBON	680	5%	1/4W
R44	1-249-418-11	CARBON	1.2K	5%	1/4W
R45	1-249-422-11	CARBON	2.7K	5%	1/4W
R47	1-249-413-11	CARBON	470	5%	1/4W
R49	1-249-413-11	CARBON	470	5%	1/4W
R50	1-249-405-11	CARBON	100	5%	1/4W
R51	1-215-417-00	METAL	680	1%	1/4W
R52	1-215-417-00	METAL	680	1%	1/4W
R53	1-215-413-00	METAL	470	1%	1/4W
R54	1-215-443-00	METAL	8.2K	1%	1/4W
R55	1-249-421-11	CARBON	2.2K	5%	1/4W
R56	1-249-441-11	CARBON	100K	5%	1/4W
R57	1-249-417-11	CARBON	1K	5%	1/4W
R58	1-249-417-11	CARBON	1K	5%	1/4W
R59	1-249-429-11	CARBON	10K	5%	1/4W
R60	1-249-433-11	CARBON	22K	5%	1/4W
R61	1-249-420-11	CARBON	1.8K	5%	1/4W
R62	1-249-429-11	CARBON	10K	5%	1/4W
R63	1-249-425-11	CARBON	4.7K	5%	1/4W
R64	1-249-429-11	CARBON	10K	5%	1/4W
R65	1-215-421-00	METAL	1K	1%	1/4W
R68	1-249-427-11	CARBON	6.8K	5%	1/4W
R69	1-215-420-00	METAL	910	1%	1/4W
R70	1-215-420-00	METAL	910	1%	1/4W
R71	1-215-417-00	METAL	680	1%	1/4W
R72	1-249-422-11	CARBON	2.7K	5%	1/4W
R73	1-249-405-11	CARBON	100	5%	1/4W
R74	1-215-421-00	METAL	1K	1%	1/4W
R77	1-249-427-11	CARBON	6.8K	5%	1/4W
R78	1-215-420-00	METAL	910	1%	1/4W
R79	1-215-420-00	METAL	910	1%	1/4W
R80	1-215-417-00	METAL	680	1%	1/4W
R81	1-249-422-11	CARBON	2.7K	5%	1/4W
R82	1-249-405-11	CARBON	100	5%	1/4W
R83	1-215-481-00	METAL	330K	1%	1/4W
R85	1-215-429-00	METAL	2.2K	1%	1/4W
R86	1-215-415-00	METAL	560	1%	1/4W
R87	1-215-477-00	METAL	220K	1%	1/4W
R88	1-215-457-00	METAL	33K	1%	1/4W
R90	1-249-429-11	CARBON	10K	5%	1/4W
R91	1-249-433-11	CARBON	22K	5%	1/4W
R95	1-249-429-11	CARBON	10K	5%	1/4W
R96	1-249-433-11	CARBON	22K	5%	1/4W
R101	1-249-423-11	CARBON	3.3K	5%	1/4W
R102	1-249-419-11	CARBON	1.5K	5%	1/4W
R103	1-249-427-11	CARBON	6.8K	5%	1/4W
R104	1-249-422-11	CARBON	2.7K	5%	1/4W
R105	1-249-429-11	CARBON	10K	5%	1/4W
R202	1-249-429-11	CARBON	10K	5%	1/4W

VARIABLE RESISTOR

Ref.No	Part No.	Description
RV1	1-237-500-21	RES, ADJ, CERMET 1K
RV2	1-237-504-21	RES, ADJ, CERMET 20K
RV3	1-237-499-21	RES, ADJ, CERMET 500
RV4	1-237-501-21	RES, ADJ, CERMET 2K
RV5	1-237-501-21	RES, ADJ, CERMET 2K

CRYSTAL

Ref.No	Part No.	Description
X1	1-567-505-11	OSCILLATOR, CRYSTAL

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Ref.No	Part No.	Description
	*A-1135-391-A	BD BOARD, COMPLETE (BVM-2015P ONLY) ***************
	*A-1135-424-A	BM BOARD, COMPLETE (BVM-2015PM ONLY) ***************
	*4-353-708-00	HOOK, FINGER (BVM-2015P ONLY)
	7-682-547-04	+BVTT 3X6, (S TYTE)
	7-682-950-01	+PSW 3X12

CAPACITOR

Ref.No	Part No.	Description			Remark
C1	1-102-947-00	CERAMIC	10PF	0.5PF	50V (BVM-2015P ONLY)
	1-102-668-00	CERAMIC	15PF	5%	50V (BVM-2015PM ONLY)
C2	1-102-947-00	CERAMIC	10PF	0.5PF	50V (BVM-2015P ONLY)
	1-102-668-00	CERAMIC	15PF	5%	50V (BVM-2015PM ONLY)
C3	1-102-963-00	CERAMIC	33PF	5%	50V (BVM-2015P ONLY)
C4	1-101-880-00	CERAMIC	47PF	5%	50V (BVM-2015P ONLY)
	1-101-361-00	CERAMIC	39PF	5%	50V (BVM-2015PM ONLY)
C6	1-101-888-00	CERAMIC	68PF	5%	50V (BVM-2015P ONLY)
	1-101-884-00	CERAMIC	56PF	5%	50V (BVM-2015PM ONLY)
C7	1-102-963-00	CERAMIC	33PF	5%	50V (BVM-2015P ONLY)
	1-101-361-00	CERAMIC	39PF	5%	50V (BVM-2015PM ONLY)
C8	1-102-943-00	CERAMIC	6PF	0.5PF	50V (BVM-2015P ONLY)
	1-102-935-00	CERAMIC	2PF	0.25PF	50V (BVM-2015PM ONLY)
C9	1-123-356-00	ELECT	10MF	20%	16V
C10	1-123-356-00	ELECT	10MF	20%	16V
C11	1-101-004-00	CERAMIC	0.01MF		50V
C12	1-101-004-00	CERAMIC	0.01MF		50V
C13	1-101-004-00	CERAMIC	0.01MF		50V
C14	1-101-004-00	CERAMIC	0.01MF		50V
C15	1-101-004-00	CERAMIC	0.01MF		50V
C16	1-101-004-00	CERAMIC	0.01MF		50V
C17	1-136-165-00	FILM	0.1MF	5%	50V
C18	1-102-950-00	CERAMIC	13PF	5%	50V (BVM-2015P ONLY)
	1-102-951-00	CERAMIC	15PF	5%	50V (BVM-2015PM ONLY)
C19	1-102-951-00	CERAMIC	15PF	5%	50V
C20	1-101-888-00	CERAMIC	68PF	5%	50V (BVM-2015P ONLY)
	1-102-758-00	CERAMIC	56PF	5%	50V (BVM-2015PM ONLY)
C21	1-163-157-00	FILM	0.022MF	5%	50V
C22	1-163-157-00	FILM	0.022MF	5%	50V
C23	1-123-380-00	ELECT	1MF	20%	50V (BVM-2015P ONLY)
	1-136-153-00	FILM	0.01MF	5%	50V (BVM-2015PM ONLY)
C24	1-101-004-00	CERAMIC	0.01MF		50V
C25	1-124-910-11	ELECT	47MF	20%	16V
C26	1-109-628-00	MICA	160PF	1%	500V (BVM-2015P ONLY)
	1-109-676-00	MICA	130PF	1%	500V (BVM-2015PM ONLY)
C27	1-102-960-00	CERAMIC	24PF	5%	50V
C28	1-109-631-00	MICA	330PF	1%	500V
C29	1-124-910-11	ELECT	47MF	20%	16V

Ref.No	Part No.	Description		Remark
C30	1-109-628-00	MICA	160PF	1% 500V (BVM-2015P ONLY)
	1-109-676-00	MICA	130PF	1% 500V (BVM-2015PM ONLY)
C31	1-102-960-00	CERAMIC	24PF	5% 50V
C32	1-109-631-00	MICA	330PF	1% 500V
C33	1-101-004-00	CERAMIC	0.01MF	50V
C34	1-136-153-00	FILM	0.01MF	5% 50V
C35	1-101-004-00	CERAMIC	0.01MF	50V
C36	1-123-379-00	ELECT	0.47MF	20% 50V
C37	1-101-004-00	CERAMIC	0.01MF	50V
C38	1-123-382-00	ELECT	3.3MF	20% 50V
C39	1-109-667-11	MICA	56PF	1% 500V
C40	1-102-942-00	CERAMIC	5PF	0.5PF 50V
C41	1-109-621-00	MICA	220PF	1% 500V
C43	1-124-910-11	ELECT	47MF	20% 16V
C44	1-124-910-11	ELECT	47MF	20% 16V
C45	1-101-004-00	CERAMIC	0.01MF	50V
C46	1-136-153-00	FILM	0.01MF	5% 50V
C49	1-123-379-00	ELECT	0.47MF	20% 50V
C50	1-123-382-00	ELECT	3.3MF	20% 50V
C51	1-109-667-11	MICA	56PF	1% 500V
C52	1-102-942-00	CERAMIC	5PF	0.5PF 50V
C53	1-109-621-00	MICA	220PF	1% 500V
C55	1-124-910-11	ELECT	47MF	20% 16V
C56	1-124-910-11	ELECT	47MF	20% 16V
C57	1-101-004-00	CERAMIC	0.01MF	50V
C58	1-101-004-00	CERAMIC	0.01MF	50V
C59	1-101-004-00	CERAMIC	0.01MF	50V
C60	1-124-910-11	ELECT	47MF	20% 16V
C62	1-102-960-00	CERAMIC	24PF	5% 50V (BVM-2015P ONLY)
C63	1-101-884-00	CERAMIC	56PF	5% 50V
C64	1-101-884-00	CERAMIC	56PF	5% 50V
C65	1-102-951-00	CERAMIC	15PF	5% 50V
C66	1-102-965-00	CERAMIC	39PF	5% 50V
C67	1-102-935-00	CERAMIC	2PF	0.25PF 50V
C68	1-124-034-51	ELECT	33MF	20% 16V
C69	1-124-034-51	ELECT	33MF	20% 16V
C70	1-123-369-00	ELECT	4.7MF	20% 50V
C71	1-101-004-00	CERAMIC	0.01MF	50V
C75	1-101-004-00	CERAMIC	0.01MF	50V
C80	1-123-611-00	ELECT	1MF	20% 50V (BVM-2015PM ONLY)
C100	1-124-034-51	ELECT	33MF	20% 16V
C101	1-124-910-11	ELECT	47MF	20% 25V
C102	1-124-034-51	ELECT	33MF	20% 16V
C103	1-124-034-51	ELECT	33MF	20% 16V
C104	1-124-034-51	ELECT	33MF	20% 16V
C106	1-124-034-51	ELECT	33MF	20% 16V
C107	1-124-034-51	ELECT	33MF	20% 16V
C108	1-124-034-51	ELECT	33MF	20% 16V
C109	1-124-034-51	ELECT	33MF	20% 16V
C110	1-124-034-51	ELECT	33MF	20% 16V
C111	1-124-034-51	ELECT	33MF	20% 16V
C112	1-124-119-00	ELECT	330MF	20% 16V
C114	1-124-034-51	ELECT	33MF	20% 16V
C115	1-124-034-51	ELECT	33MF	20% 16V
C121	1-101-004-00	CERAMIC	0.01MF	50V
C122	1-101-004-00	CERAMIC	0.01MF	50V
C123	1-101-004-00	CERAMIC	0.01MF	50V
C124	1-101-004-00	CERAMIC	0.01MF	50V
C125	1-101-004-00	CERAMIC	0.01MF	50V
C126	1-101-004-00	CERAMIC	0.01MF	50V
C200	1-124-034-51	ELECT	33MF	20% 16V
C201	1-124-910-11	ELECT	47MF	20% 25V
C202	1-124-034-51	ELECT	33MF	20% 16V
C203	1-124-034-51	ELECT	33MF	20% 16V
C204	1-101-004-00	CERAMIC	0.01MF	50V
C220	1-101-004-00	CERAMIC	0.01MF	50V
C221	1-101-004-00	CERAMIC	0.01MF	50V
C222	1-101-004-00	CERAMIC	0.01MF	50V
C224	1-101-004-00	CERAMIC	0.01MF	50V
C225	1-101-004-00	CERAMIC	0.01MF	50V
C226	1-101-004-00	CERAMIC	0.01MF	50V
C227	1-123-330-00	ELECT	22MF	20% 25V
C250	1-124-034-51	ELECT	33MF	20% 16V
C251	1-101-004-00	CERAMIC	0.01MF	50V
C301	1-101-004-00	CERAMIC	0.01MF	50V
C302	1-101-004-00	CERAMIC	0.01MF	50V
C303	1-101-004-00	CERAMIC	0.01MF	50V
C304	1-102-947-00	CERAMIC	10PF	0.5PF 50V (BVM-2015P ONLY)
C312	1-101-004-00	CERAMIC	0.01MF	50V
C313	1-101-004-00	CERAMIC	0.01MF	50V
C316	1-102-935-00	CERAMIC	2PF	0.25PF 50V (BVM-2015P ONLY)
	1-102-947-00	CERAMIC	10PF	0.5PF 50V (BVM-2015PM ONLY)
C350	1-102-963-00	CERAMIC	33PF	5% 50V (BVM-2015P ONLY)
	1-102-959-00	CERAMIC	22PF	5% 50V (BVM-2015PM ONLY)

TRIMMER

Ref.No	Part No.	Description
CV1	1-141-171-00	CAP, TRIMMER 15P
CV2	1-141-179-12	CAP, TRIMMER, 5PF-8PF

DIODE

Ref.No	Part No.	Description
D1	8-719-911-19	DIODE 1SS119
D2	8-719-911-19	DIODE 1SS119
D4	8-719-109-63	DIODE RD3.0ES-B2
D5	8-719-110-13	DIODE RD9.1ES-B2
D6	8-719-911-19	DIODE 1SS119
D10	8-719-920-95	DIODE 1T25-0
D11	8-719-911-19	DIODE 1SS119
D12	8-719-110-31	DIODE RD12ES-B2
D13	8-719-110-31	DIODE RD12ES-B2
D15	8-719-911-19	DIODE 1SS119 (BVM-2015PM ONLY)
D16	8-719-911-19	DIODE 1SS119
D201	8-719-911-19	DIODE 1SS119
D202	8-719-911-19	DIODE 1SS119

IC

Ref.No	Part No.	Description
IC1	8-759-204-21	IC TA7193P
IC2	8-759-800-81	IC LA7016
IC3	8-759-201-69	IC TL8608P
	*1-526-654-00	SOCKET, IC (DP) 16P; IC3
IC4	8-759-201-69	IC TL8608P
	*1-526-654-00	SOCKET, IC (DP) 16P; IC4
IC5	8-759-040-53	IC MC14053BCP
IC6	8-759-800-81	IC LA7016
IC7	8-759-981-91	IC RC4558DQ
IC8	8-759-981-91	IC RC4558DQ

COIL

Ref.No	Part No.	Description
L1	1-408-533-00	COIL, VARIABLE
L2	1-408-532-00	COIL, VARIABLE (BVM-2015P ONLY)
	1-408-514-00	COIL, (VARIABLE) (BVM-2015PM ONLY)
L3	1-408-514-00	COIL, (VARIABLE) (BVM-2015P ONLY)
	1-408-533-00	COIL, VARIABLE (BVM-2015PM ONLY)
L4	1-408-421-00	INDUCTOR, 100UH
L5	1-408-429-00	INDUCTOR, 470UH

Ref.No	Part No.	Description	Remark
L6	1-408-429-00	INDUCTOR, 470UH	
L8	1-408-421-00	INDUCTOR, 100UH	
L101	1-408-421-00	INDUCTOR, 100UH	
L102	1-408-421-00	INDUCTOR, 100UH	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q1	8-729-600-24	TRANSISTOR 2SC403SP-51	
Q2	8-729-600-24	TRANSISTOR 2SC403SP-51	
Q3	8-729-600-24	TRANSISTOR 2SC403SP-51	
Q4	8-729-800-10	TRANSISTOR 2SC3068	
Q5	8-729-800-10	TRANSISTOR 2SC3068	
Q6	8-729-384-48	TRANSISTOR 2SA844	
Q7	8-729-600-24	TRANSISTOR 2SC403SP-51	
Q8	8-729-384-48	TRANSISTOR 2SA844	
Q9	8-729-600-24	TRANSISTOR 2SC403SP-51	
Q10	8-729-119-76	TRANSISTOR 2SA1175-HFE	(BVM-2015P ONLY)
	8-729-384-48	TRANSISTOR 2SA844	(BVM-2015PM ONLY)
Q11	8-729-119-76	TRANSISTOR 2SA1175-HFE	(BVM-2015P ONLY)
	8-729-384-48	TRANSISTOR 2SA844	(BVM-2015PM ONLY)
Q12	8-729-600-24	TRANSISTOR 2SC403SP-51	
Q13	8-729-600-24	TRANSISTOR 2SC403SP-51	
Q14	8-729-600-24	TRANSISTOR 2SC403SP-51	
Q15	8-729-600-24	TRANSISTOR 2SC403SP-51	
Q16	8-729-600-24	TRANSISTOR 2SC403SP-51	
Q17	8-729-600-24	TRANSISTOR 2SC403SP-51	
Q18	8-729-601-47	TRANSISTOR 2SK381-B	
Q20	8-729-119-76	TRANSISTOR 2SA1175-HFE	(BVM-2015P ONLY)
	8-729-384-48	TRANSISTOR 2SA844	(BVM-2015PM ONLY)
Q21	8-729-600-24	TRANSISTOR 2SC403SP-51	
Q22	8-729-600-24	TRANSISTOR 2SC403SP-51	
Q23	8-729-384-48	TRANSISTOR 2SA844	
Q24	8-729-600-24	TRANSISTOR 2SC403SP-51	
Q25	8-729-800-10	TRANSISTOR 2SC3068	
Q26	8-729-601-47	TRANSISTOR 2SK381-B	
Q28	8-729-119-76	TRANSISTOR 2SA1175-HFE	(BVM-2015P ONLY)
	8-729-384-48	TRANSISTOR 2SA844	(BVM-2015PM ONLY)
Q29	8-729-600-24	TRANSISTOR 2SC403SP-51	
Q30	8-729-600-24	TRANSISTOR 2SC403SP-51	
Q31	8-729-384-48	TRANSISTOR 2SA844	
Q32	8-729-600-24	TRANSISTOR 2SC403SP-51	
Q33	8-729-800-10	TRANSISTOR 2SC3068	
Q34	8-729-600-24	TRANSISTOR 2SC403SP-51	
Q35	8-729-600-24	TRANSISTOR 2SC403SP-51	
Q36	8-729-600-24	TRANSISTOR 2SC403SP-51	
Q38	8-729-600-24	TRANSISTOR 2SC403SP-51	
Q101	8-729-140-97	TRANSISTOR 2SB734-34	
Q102	8-729-378-91	TRANSISTOR 2SD789	
Q103	8-729-900-63	TRANSISTOR DTA124ES	
Q104	8-729-900-63	TRANSISTOR DTA124ES	

RESISTOR

Ref.No	Part No.	Description	Remark
R1	1-249-428-11	CARBON 8.2K 5% 1/4W	
R2	1-249-429-11	CARBON 10K 5% 1/4W	
R3	1-249-422-11	CARBON 2.7K 5% 1/4W	
R4	1-215-425-00	METAL 1.5K 1% 1/6W	(BVM-2015P ONLY)
	1-215-421-00	METAL 1K 1% 1/6W	(BVM-2015PM ONLY)
R5	1-215-395-00	METAL 82 1% 1/6W	(BVM-2015P ONLY)
	1-215-398-00	METAL 110 1% 1/6W	(BVM-2015PM ONLY)
R6	1-215-421-00	METAL 1K 1% 1/6W	
R7	1-215-421-00	METAL 1K 1% 1/6W	
R8	1-215-423-00	METAL 1.2K 1% 1/6W	(BVM-2015P ONLY)
	1-215-427-00	METAL 1.8K 1% 1/6W	(BVM-2015PM ONLY)
R9	1-215-421-00	METAL 1K 1% 1/6W	
R10	1-215-421-00	METAL 1K 1% 1/6W	
R11	1-215-391-00	METAL 56 1% 1/6W	(BVM-2015P ONLY)
	1-215-400-00	METAL 130 1% 1/6W	(BVM-2015PM ONLY)
R12	1-215-427-00	METAL 1.8K 1% 1/6W	(BVM-2015P ONLY)
	1-215-429-00	METAL 2.2K 1% 1/6W	(BVM-2015PM ONLY)
R13	1-249-425-11	CARBON 4.7K 5% 1/4W	
R14	1-249-429-11	CARBON 10K 5% 1/4W	
R15	1-249-429-11	CARBON 10K 5% 1/4W	
R17	1-249-433-11	CARBON 22K 5% 1/4W	
R18	1-215-425-00	METAL 1.5K 1% 1/6W	
R19	1-215-425-00	METAL 1.5K 1% 1/6W	
R20	1-215-425-00	METAL 1.5K 1% 1/6W	
R21	1-215-425-00	METAL 1.5K 1% 1/6W	
R22	1-249-405-11	CARBON 100 5% 1/4W	
R23	1-215-441-00	METAL 6.8K 1% 1/6W	(BVM-2015P ONLY)
	1-215-439-00	METAL 5.6K 1% 1/6W	(BVM-2015PM ONLY)
R24	1-215-469-00	METAL 100K 1% 1/6W	
R25	1-249-427-11	CARBON 6.8K 5% 1/4W	(BVM-2015P ONLY)
	1-249-425-11	CARBON 4.7K 5% 1/4W	(BVM-2015PM ONLY)
R26	1-249-415-11	CARBON 680 5% 1/4W	(BVM-2015P ONLY)
	1-249-418-11	CARBON 1.2K 5% 1/4W	(BVM-2015PM ONLY)
R27	1-249-415-11	CARBON 680 5% 1/4W	
R28	1-249-420-11	CARBON 1.8K 5% 1/4W	(BVM-2015P ONLY)
	1-249-423-11	CARBON 3.3K 5% 1/4W	(BVM-2015PM ONLY)
R29	1-249-422-11	CARBON 2.7K 5% 1/4W	
R30	1-249-405-11	CARBON 100 5% 1/4W	
R31	1-247-903-00	CARBON 1M 5% 1/4W	
R32	1-249-429-11	CARBON 10K 5% 1/4W	
R34	1-215-407-00	METAL 270 1% 1/6W	(BVM-2015P ONLY)
	1-215-417-00	METAL 680 1% 1/6W	(BVM-2015PM ONLY)
R35	1-215-407-00	METAL 270 1% 1/6W	(BVM-2015P ONLY)
	1-215-417-00	METAL 680 1% 1/6W	(BVM-2015PM ONLY)
R36	1-215-413-00	METAL 470 1% 1/6W	
R37	1-215-443-00	METAL 8.2K 1% 1/6W	
R38	1-249-441-11	CARBON 100K 5% 1/4W	
R39	1-215-425-00	METAL 1.5K 1% 1/6W	(BVM-2015P ONLY)
	1-215-429-00	METAL 2.2K 1% 1/6W	(BVM-2015PM ONLY)
R40	1-215-421-00	METAL 1K 1% 1/6W	(BVM-2015P ONLY)
	1-249-417-11	CARBON 1K 5% 1/4W	(BVM-2015PM ONLY)
R41	1-215-429-00	METAL 2.2K 1% 1/6W	(BVM-2015P ONLY)
	1-249-421-11	CARBON 2.2K 5% 1/4W	(BVM-2015PM ONLY)
R42	1-215-445-00	METAL 10K 1% 1/6W	(BVM-2015P ONLY)
	1-249-429-11	CARBON 10K 5% 1/4W	(BVM-2015PM ONLY)
R43	1-215-421-00	METAL 1K 1% 1/6W	(BVM-2015P ONLY)
	1-249-417-11	CARBON 1K 5% 1/4W	(BVM-2015PM ONLY)

Ref.No	Part No.	Description			Remark
R44	1-249-433-11	CARBON	22K	5%	1/4W
R45	1-249-429-11	CARBON	10K	5%	1/4W
R46	1-249-429-11	CARBON	10K	5%	1/4W
R47	1-249-441-11	CARBON	100K	5%	1/4W
R48	1-249-425-11	CARBON	4.7K	5%	1/4W
R54	1-249-422-11	CARBON	2.7K	5%	1/4W
R55	1-215-418-00	METAL	750	1%	1/6W (BVM-2015P ONLY)
	1-215-420-00	METAL	910	1%	1/6W (BVM-2015PM ONLY)
R56	1-215-420-00	METAL	910	1%	1/6W
R57	1-249-415-11	CARBON	680	5%	1/4W
R58	1-249-422-11	CARBON	2.7K	5%	1/4W
R59	1-249-422-11	CARBON	2.7K	5%	1/4W
R60	1-215-418-00	METAL	750	1%	1/6W (BVM-2015P ONLY)
	1-215-420-00	METAL	910	1%	1/6W (BVM-2015PM ONLY)
R61	1-215-420-00	METAL	910	1%	1/6W
R62	1-249-415-11	CARBON	680	5%	1/4W
R63	1-249-422-11	CARBON	2.7K	5%	1/4W
R64	1-215-477-00	METAL	220K	1%	1/6W (BVM-2015P ONLY)
	1-249-417-11	CARBON	1K	5%	1/4W (BVM-2015PM ONLY)
R65	1-215-435-00	METAL	3.9K	1%	1/6W (BVM-2015P ONLY)
	1-215-429-00	METAL	2.2K	1%	1/6W (BVM-2015PM ONLY)
R66	1-249-405-11	CARBON	100	5%	1/4W
R70	1-247-903-00	CARBON	1M	5%	1/4W
R71	1-249-429-11	CARBON	10K	5%	1/4W
R72	1-249-429-11	CARBON	10K	5%	1/4W
R73	1-249-429-11	CARBON	10K	5%	1/4W
R74	1-249-417-11	CARBON	1K	5%	1/4W
R75	1-249-427-11	CARBON	6.8K	5%	1/4W
R76	1-249-427-11	CARBON	6.8K	5%	1/4W
R77	1-249-425-11	CARBON	4.7K	5%	1/4W
R78	1-215-424-00	METAL	1.3K	1%	1/6W
R79	1-215-419-00	METAL	820	1%	1/6W
R80	1-215-425-00	METAL	1.5K	1%	1/6W
R81	1-249-422-11	CARBON	2.7K	5%	1/4W
R82	1-249-425-11	CARBON	4.7K	5%	1/4W
R83	1-249-435-11	CARBON	33K	5%	1/4W
R84	1-249-435-11	CARBON	33K	5%	1/4W
R85	1-247-903-00	CARBON	1M	5%	1/4W
R86	1-249-429-11	CARBON	10K	5%	1/4W
R87	1-249-429-11	CARBON	10K	5%	1/4W
R88	1-249-429-11	CARBON	10K	5%	1/4W
R89	1-249-417-11	CARBON	1K	5%	1/4W
R90	1-249-427-11	CARBON	6.8K	5%	1/4W
R91	1-249-427-11	CARBON	6.8K	5%	1/4W
R92	1-249-425-11	CARBON	4.7K	5%	1/4W
R93	1-215-424-00	METAL	1.3K	1%	1/6W
R94	1-215-419-00	METAL	820	1%	1/6W
R95	1-215-425-00	METAL	1.5K	1%	1/6W
R96	1-249-422-11	CARBON	2.7K	5%	1/4W
R97	1-249-425-11	CARBON	4.7K	5%	1/4W
R98	1-249-435-11	CARBON	33K	5%	1/4W
R99	1-249-435-11	CARBON	33K	5%	1/4W
R100	1-215-438-00	METAL	5.1K	1%	1/6W
R101	1-215-438-00	METAL	5.1K	1%	1/6W
R102	1-215-438-00	METAL	5.1K	1%	1/6W
R103	1-215-438-00	METAL	5.1K	1%	1/6W
R104	1-249-437-11	CARBON	47K	5%	1/4W
R105	1-249-438-11	CARBON	56K	5%	1/4W
R106	1-249-417-11	CARBON	1K	5%	1/4W

Ref.No	Part No.	Description			Remark
R107	1-249-417-11	CARBON	1K	5%	1/4W
R108	1-249-417-11	CARBON	1K	5%	1/4W
R109	1-249-417-11	CARBON	1K	5%	1/4W
R110	1-249-417-11	CARBON	1K	5%	1/4W
R115	1-215-438-00	METAL	5.1K	1%	1/6W (BVM-2015P ONLY)
	1-215-429-00	METAL	2.2K	1%	1/6W (BVM-2015PM ONLY)
R116	1-215-438-00	METAL	5.1K	1%	1/6W (BVM-2015P ONLY)
	1-215-429-00	METAL	2.2K	1%	1/6W (BVM-2015PM ONLY)
R120	1-249-429-11	CARBON	10K	5%	1/4W
R121	1-249-429-11	CARBON	10K	5%	1/4W
R130	1-215-477-00	METAL	220K	1%	1/6W (BVM-2015P ONLY)
	1-215-485-00	METAL	470K	1%	1/6W (BVM-2015PM ONLY)
R150	1-249-441-11	CARBON	100K	5%	1/4W
R201	1-249-423-11	CARBON	3.3K	5%	1/4W
R202	1-249-423-11	CARBON	3.3K	5%	1/4W
R203	1-249-422-11	CARBON	2.7K	5%	1/4W
R204	1-249-423-11	CARBON	3.3K	5%	1/4W
R220	1-249-441-11	CARBON	100K	5%	1/4W
R221	1-249-433-11	CARBON	22K	5%	1/4W
R222	1-249-433-11	CARBON	22K	5%	1/4W
R250	1-215-415-00	METAL	560	1%	1/6W
R251	1-215-415-00	METAL	560	1%	1/6W
R252	1-215-421-00	METAL	1K	1%	1/6W
R254	1-249-429-11	CARBON	10K	5%	1/4W
R255	1-249-441-11	CARBON	100K	5%	1/4W
R259	1-215-421-00	METAL	1K	1%	1/6W
R301	1-215-469-00	METAL	100K	1%	1/6W
R302	1-215-491-00	METAL	820K	1%	1/6W
R303	1-249-418-11	CARBON	1.2K	5%	1/4W
R305	1-249-431-11	CARBON	15K	5%	1/4W
R306	1-249-428-11	CARBON	8.2K	5%	1/4W
R307	1-249-417-11	CARBON	1K	5%	1/4W
R308	1-249-417-11	CARBON	1K	5%	1/4W
R310	1-249-422-11	CARBON	2.7K	5%	1/4W
R314	1-215-417-00	METAL	680	1%	1/6W
R315	1-249-422-11	CARBON	2.7K	5%	1/4W
R316	1-249-413-11	CARBON	470	5%	1/4W
R317	1-249-413-11	CARBON	470	5%	1/4W
R320	1-215-472-00	METAL	130K	1%	1/6W (BVM-2015P ONLY)
	1-215-482-00	METAL	360K	1%	1/6W (BVM-2015PM ONLY)
R353	1-249-432-11	CARBON	18K	5%	1/4W
R354	1-249-432-11	CARBON	18K	5%	1/4W
R400	1-215-429-00	METAL	2.2K	1%	1/6W

VARIABLE RESISTOR

Ref.No	Part No.	Description
RV1	1-237-515-21	RES, ADJ. CERMET 1K
RV2	1-237-499-21	RES, ADJ. CERMET 500
RV3	1-237-501-21	RES, ADJ. CERMET 2K
RV4	1-237-501-21	RES, ADJ. CERMET 2K
RV5	1-237-517-21	RES, ADJ. CERMET 5K
RV6	1-237-517-21	RES, ADJ. CERMET 5K
RV7	1-237-504-21	RES, ADJ. CERMET 20K
RV8	1-237-504-21	RES, ADJ. CERMET 20K
RV9	1-237-517-21	RES, ADJ. CERMET 5K
RV10	1-237-517-21	RES, ADJ. CERMET 5K

THERMISTOR

Ref.No	Part No.	Description
TH1	1-800-202-99	THERMISTOR S-10K (BVM-2015PM ONLY)

CRYSTAL

Ref.No	Part No.	Description	Remark
X1	1567-504-11	OSCILLATOR, CRYSTAL (BVM-2015P ONLY)	
	1-527-825-00	VIBRATOR, CRYSTAL (BVM-2015PM ONLY)	
X2	1-567-409-11	VIBRATOR, CRYSTAL (BVM-2015P ONLY)	
	1-567-416-11	VIBRATOR, CRYSTAL (BVM-2015PM ONLY)	

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*A-1135-537-A BG BOARD, COMPLETE
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*4-353-708-00 HOOK, FINGER
7-682-547-04 SCREW BVTT 3X6 (S)

CAPACITOR

Ref.No	Part No.	Description				Remark
C1	1-124-910-11	ELECT	47MF	20%	16V	
C2	1-124-910-11	ELECT	47MF	20%	16V	
C3	1-123-356-00	ELECT	10MF	20%	16V	
C4	1-124-910-11	ELECT	47MF	20%	16V	
C7	1-101-004-00	CERAMIC	0.01MF		50V	
C8	1-101-004-00	CERAMIC	0.01MF		50V	
C9	1-101-004-00	CERAMIC	0.01MF		50V	
C10	1-102-935-00	CERAMIC	2PF	0.25PF	50V	
C12	1-101-004-00	CERAMIC	0.01MF		50V	
C15	1-102-965-00	CERAMIC	39PF	5%	50V	
C16	1-101-004-00	CERAMIC	0.01MF		50V	
C22	1-101-004-00	CERAMIC	0.01MF		50V	
C25	1-102-965-00	CERAMIC	39PF	5%	50V	
C26	1-101-004-00	CERAMIC	0.01MF		50V	
C32	1-101-004-00	CERAMIC	0.01MF		50V	
C33	1-136-165-00	FILM	0.1MF	5%	50V	
C34	1-136-165-00	FILM	0.1MF	5%	50V	
C35	1-136-165-00	FILM	0.1MF	5%	50V	
C51	1-102-942-00	CERAMIC	5PF	0.5PF	50V	
C52	1-102-942-00	CERAMIC	5PF	0.5PF	50V	
C53	1-123-356-00	ELECT	10MF	20%	25V	
C54	1-101-004-00	CERAMIC	0.01MF		50V	
C55	1-102-976-00	CERAMIC	180PF	5%	50V	
C56	1-102-976-00	CERAMIC	180PF	5%	50V	
C101	1-124-034-51	ELECT	33MF	20%	16V	
C102	1-124-034-51	ELECT	33MF	20%	16V	
C103	1-124-034-51	ELECT	33MF	20%	16V	
C105	1-124-122-11	ELECT	100MF	20%	16V	
C106	1-124-034-51	ELECT	33MF	20%	16V	
C111	1-123-356-00	ELECT	10MF	20%	16V	
C112	1-101-004-00	CERAMIC	0.01MF		50V	
C113	1-101-004-00	CERAMIC	0.01MF		50V	
C114	1-101-004-00	CERAMIC	0.01MF		50V	
C115	1-101-004-00	CERAMIC	0.01MF		50V	
C116	1-101-004-00	CERAMIC	0.01MF		50V	
C117	1-101-004-00	CERAMIC	0.01MF		50V	
C131	1-124-034-51	ELECT	33MF	20%	16V	
C132	1-124-034-51	ELECT	33MF	20%	16V	
C133	1-124-034-51	ELECT	33MF	20%	16V	
C135	1-124-122-11	ELECT	100MF	20%	16V	
C136	1-124-034-51	ELECT	33MF	20%	16V	
C141	1-101-004-00	CERAMIC	0.01MF		50V	
C142	1-101-004-00	CERAMIC	0.01MF		50V	
C143	1-101-004-00	CERAMIC	0.01MF		50V	
C144	1-101-004-00	CERAMIC	0.01MF		50V	
C145	1-101-004-00	CERAMIC	0.01MF		50V	
C146	1-101-004-00	CERAMIC	0.01MF		50V	
C147	1-101-004-00	CERAMIC	0.01MF		50V	

VARIABLE CAPACITOR

Ref.No	Part No.	Description	Remark
CV2	1-141-181-11	CAP,TRIMMER	
CV2	1-141-181-11	CAP,TRIMMER	
CV3	1-141-171-00	CAP,TRIMMER 20P	
CV3	1-141-171-00	CAP,TRIMMER 20P	

DIODE

Ref.No	Part No.	Description	Remark
D1	8-719-911-19	DIODE 1SS119	
D2	8-719-911-19	DIODE 1SS119	
D5	8-719-911-19	DIODE 1SS119	
D6	8-719-911-19	DIODE 1SS119	
D7	8-719-911-19	DIODE 1SS119	
D16	8-719-911-19	DIODE 1SS119	
D17	8-719-911-19	DIODE 1SS119	

DELAY LINE

Ref.No	Part No.	Description	Remark
DL1	1-415-477-11	DELAY LINE	
DL2	1-415-458-11	DELAY LINE	
DL3	1-415-458-11	DELAY LINE	
DL4	1-415-458-11	DELAY LINE	

IC

Ref.No	Part No.	Description	Remark
IC1	8-759-800-81	IC LA7016	
IC2	8-766-001-49	TRANSISTOR TX-429M	
IC3	8-759-945-58	IC RC4558P	
IC4	8-757-182-14	IC CX-718D-1	
IC5	8-759-140-53	IC MC14053BCP	
IC6	8-759-140-53	IC MC14053BCP	
IC7	8-759-990-82	IC TL082CP	

COIL

Ref.No	Part No.	Description		Remark
L2	1-408-408-00	INDUCTOR	8.2UH	
L3	1-408-413-00	INDUCTOR	22UH	
L4	1-408-413-00	INDUCTOR	22UH	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q1	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q5	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q7	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q8	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q9	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q10	8-729-384-48	TRANSISTOR 2SA844-E	
Q11	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q12	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q13	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q14	8-729-800-10	TRANSISTOR 2SC3068	
Q21	8-729-384-48	TRANSISTOR 2SA844-E	
Q22	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q23	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q24	8-729-600-19	TRANSISTOR 2SK381-A	
Q25	8-729-384-48	TRANSISTOR 2SA844-E	
Q26	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q27	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q28	8-729-600-19	TRANSISTOR 2SK381-A	
Q29	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q30	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q31	8-729-384-48	TRANSISTOR 2SA844-E	
Q32	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q33	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q34	8-729-600-19	TRANSISTOR 2SK381-A	
Q35	8-729-384-48	TRANSISTOR 2SA844-E	
Q36	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q37	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q38	8-729-600-19	TRANSISTOR 2SK381-A	
Q39	8-729-119-78	TRANSISTOR 2SC2785-HFE	

Ref.No	Part No.	Description	Remark
Q40	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q41	8-729-384-48	TRANSISTOR 2SA844-E	
Q42	8-729-384-48	TRANSISTOR 2SA844-E	
Q43	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q44	8-729-384-48	TRANSISTOR 2SA844-E	
Q45	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q49	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q50	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q71	8-729-384-48	TRANSISTOR 2SA844-E	
Q72	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q73	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q74	8-729-384-48	TRANSISTOR 2SA844-E	
Q75	8-729-800-10	TRANSISTOR 2SC3068	
Q76	8-729-900-36	TRANSISTOR XDA124ES	
Q77	8-729-900-36	TRANSISTOR XDA124ES	
Q81	8-729-384-48	TRANSISTOR 2SA844-E	
Q82	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q83	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q84	8-729-384-48	TRANSISTOR 2SA844-E	
Q85	8-729-800-10	TRANSISTOR 2SC3068	

RESISTOR

Ref.No	Part No.	Description			Remark
R1	1-249-405-11	CARBON	100	5%	1/4W
R2	1-215-396-00	METAL	91	1%	1/4W
R3	1-215-431-00	METAL	2.7K	1%	1/4W
R4	1-249-419-11	CARBON	1.5K	5%	1/4W
R6	1-249-405-11	CARBON	100	5%	1/4W
R7	1-249-405-11	CARBON	100	5%	1/4W
R8	1-249-429-11	CARBON	10K	5%	1/4W
R10	1-247-830-11	CARBON	910	5%	1/4W
R11	1-249-417-11	CARBON	1K	5%	1/4W
R12	1-249-417-11	CARBON	1K	5%	1/4W
R13	1-215-462-00	METAL	51K	1%	1/4W
R14	1-249-426-11	CARBON	5.6K	5%	1/4W
R15	1-247-903-00	CARBON	1M	5%	1/4W
R16	1-215-477-00	METAL	220K	1%	1/4W
R17	1-249-429-11	CARBON	10K	5%	1/4W
R18	1-249-429-11	CARBON	10K	5%	1/4W
R19	1-249-417-11	CARBON	1K	5%	1/4W
R20	1-215-421-00	METAL	1K	1%	1/4W
R21	1-215-421-00	METAL	1K	1%	1/4W
R22	1-249-441-11	CARBON	100K	5%	1/4W
R23	1-215-409-00	METAL	330	1%	1/4W
R24	1-215-380-00	METAL	20	1%	1/4W
R25	1-215-380-00	METAL	20	1%	1/4W
R26	1-215-409-00	METAL	330	1%	1/4W
R27	1-249-429-11	CARBON	10K	5%	1/4W
R28	1-249-417-11	CARBON	1K	5%	1/4W
R29	1-215-418-00	METAL	750	1%	1/4W
R30	1-249-422-11	CARBON	2.7K	5%	1/4W
R31	1-249-405-11	CARBON	100	5%	1/4W
R32	1-249-420-11	CARBON	1.8K	5%	1/4W
R33	1-249-429-11	CARBON	10K	5%	1/4W
R34	1-249-428-11	CARBON	8.2K	5%	1/4W
R35	1-249-417-11	CARBON	1K	5%	1/4W
R36	1-249-422-11	CARBON	2.7K	5%	1/4W
R37	1-249-405-11	CARBON	100	5%	1/4W
R40	1-249-425-11	CARBON	4.7K	5%	1/4W
R41	1-249-422-11	CARBON	2.7K	5%	1/4W
R42	1-249-417-11	CARBON	1K	5%	1/4W
R43	1-249-417-11	CARBON	1K	5%	1/4W
R44	1-249-431-11	CARBON	15K	5%	1/4W
R45	1-249-423-11	CARBON	3.3K	5%	1/4W
R46	1-249-417-11	CARBON	1K	5%	1/4W
R47	1-249-423-11	CARBON	3.3K	5%	1/4W
R48	1-249-422-11	CARBON	2.7K	5%	1/4W
R49	1-249-405-11	CARBON	100	5%	1/4W
R50	1-249-422-11	CARBON	2.7K	5%	1/4W
R51	1-247-903-00	CARBON	1M	5%	1/4W
R52	1-247-866-11	CARBON	30K	5%	1/4W
R53	1-215-445-00	METAL	10K	1%	1/4W
R54	1-249-420-11	CARBON	1.8K	5%	1/4W
R55	1-249-422-11	CARBON	2.7K	5%	1/4W
R56	1-249-405-11	CARBON	100	5%	1/4W
R57	1-249-422-11	CARBON	2.7K	5%	1/4W
R58	1-249-422-11	CARBON	2.7K	5%	1/4W
R59	1-249-422-11	CARBON	2.7K	5%	1/4W
R61	1-249-422-11	CARBON	2.7K	5%	1/4W
R62	1-249-417-11	CARBON	1K	5%	1/4W
R63	1-249-417-11	CARBON	1K	5%	1/4W
R64	1-249-431-11	CARBON	15K	5%	1/4W
R65	1-249-423-11	CARBON	3.3K	5%	1/4W
R66	1-249-417-11	CARBON	1K	5%	1/4W
R67	1-249-423-11	CARBON	3.3K	5%	1/4W
R68	1-249-422-11	CARBON	2.7K	5%	1/4W
R69	1-249-405-11	CARBON	100	5%	1/4W
R70	1-249-422-11	CARBON	2.7K	5%	1/4W
R71	1-247-903-00	CARBON	1M	5%	1/4W
R72	1-247-866-11	CARBON	30K	5%	1/4W
R73	1-215-445-00	METAL	10K	1%	1/4W
R74	1-249-420-11	CARBON	1.8K	5%	1/4W
R75	1-249-422-11	CARBON	2.7K	5%	1/4W
R76	1-249-405-11	CARBON	100	5%	1/4W
R77	1-249-422-11	CARBON	2.7K	5%	1/4W
R78	1-249-422-11	CARBON	2.7K	5%	1/4W
R79	1-249-422-11	CARBON	2.7K	5%	1/4W
R80	1-249-405-11	CARBON	100	5%	1/4W
R81	1-249-422-11	CARBON	2.7K	5%	1/4W
R82	1-247-903-00	CARBON	1M	5%	1/4W
R83	1-249-420-11	CARBON	1.8K	5%	1/4W
R84	1-249-405-11	CARBON	100	5%	1/4W
R85	1-247-866-11	CARBON	30K	5%	1/4W
R86	1-215-445-00	METAL	10K	1%	1/4W
R87	1-249-422-11	CARBON	2.7K	5%	1/4W
R88	1-215-430-00	METAL	2.4K	1%	1/4W
R89	1-215-443-00	METAL	8.2K	1%	1/4W
R90	1-249-430-11	CARBON	12K	5%	1/4W
R91	1-249-405-11	CARBON	100	5%	1/4W
R92	1-247-830-11	CARBON	910	5%	1/4W
R93	1-215-421-00	METAL	1K	1%	1/4W
R94	1-249-422-11	CARBON	2.7K	5%	1/4W
R98	1-249-422-11	CARBON	2.7K	5%	1/4W
R99	1-249-422-11	CARBON	2.7K	5%	1/4W
R161	1-215-438-00	METAL	5.1K	1%	1/4W
R162	1-249-431-11	CARBON	15K	5%	1/4W
R163	1-249-417-11	CARBON	1K	5%	1/4W
R164	1-215-435-00	METAL	3.9K	1%	1/4W
R165	1-249-422-11	CARBON	2.7K	5%	1/4W
R166	1-249-422-11	CARBON	2.7K	5%	1/4W
R167	1-215-409-00	METAL	330	1%	1/4W
R168	1-215-411-00	METAL	390	1%	1/4W
R169	1-215-427-00	METAL	1.8K	1%	1/4W
R170	1-249-425-11	CARBON	4.7K	5%	1/4W
R171	1-215-436-00	METAL	4.3K	1%	1/4W
R172	1-249-431-11	CARBON	15K	5%	1/4W
R173	1-249-417-11	CARBON	1K	5%	1/4W
R174	1-215-435-00	METAL	3.9K	1%	1/4W
R175	1-249-422-11	CARBON	2.7K	5%	1/4W
R176	1-249-422-11	CARBON	2.7K	5%	1/4W
R177	1-215-409-00	METAL	330	1%	1/4W
R178	1-215-414-00	METAL	510	1%	1/4W

Ref.No	Part No.	Description			Remark
R179	1-215-422-00	METAL	1.1K	1%	1/4W
R180	1-249-425-11	CARBON	4.7K	5%	1/4W
R181	1-215-380-00	METAL	20	1%	1/4W
R182	1-215-380-00	METAL	20	1%	1/4W
R183	1-249-433-11	CARBON	22K	5%	1/4W
R184	1-249-425-11	CARBON	4.7K	5%	1/4W
R201	1-249-437-11	CARBON	47K	5%	1/4W
R202	1-249-429-11	CARBON	10K	5%	1/4W
R203	1-249-435-11	CARBON	33K	5%	1/4W
R204	1-247-872-11	CARBON	51K	5%	1/4W

VARIABLE RESISTOR

Ref.No	Part No.	Description
RV1	1-237-514-21	RES, ADJ, CERMET 500
RV2	1-237-508-21	RES, ADJ, CERMET 500K
RV3	1-237-498-21	RES, ADJ, CERMET 200
RV4	1-237-500-21	RES, ADJ, CERMET 1K
RV5	1-237-500-21	RES, ADJ, CERMET 1K
RV21	1-237-517-21	RES, ADJ, CERMET 5K
RV22	1-237-517-21	RES, ADJ, CERMET 5K

SWITCH

Ref.No	Part No.	Description
S1	1-570-857-11	SWITCH, SLIDE

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*A-1135-359-A BH BOARD, COMPLETE
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Part No.	Description
*4-353-708-00	HOOK, FINGER
7-682-547-04	SCREW BVTT 3X6 (S)

CAPACITOR

Ref.No	Part No.	Description			Remark
C1	1-124-034-51	ELECT	33MF	20%	16V
C2	1-124-034-51	ELECT	33MF	20%	16V
C3	1-124-034-51	ELECT	33MF	20%	16V
C4	1-124-034-51	ELECT	33MF	20%	16V
C5	1-124-034-51	ELECT	33MF	20%	16V
C6	1-124-034-51	ELECT	33MF	20%	16V
C7	1-124-034-51	ELECT	33MF	20%	16V
C8	1-124-034-51	ELECT	33MF	20%	16V
C9	1-124-034-51	ELECT	33MF	20%	16V
C10	1-124-034-51	ELECT	33MF	20%	16V
C11	1-124-034-51	ELECT	33MF	20%	16V
C12	1-124-034-51	ELECT	33MF	20%	16V
C13	1-124-034-51	ELECT	33MF	20%	16V
C14	1-124-034-51	ELECT	33MF	20%	16V
C15	1-101-004-00	CERAMIC	0.01MF		50V
C16	1-101-004-00	CERAMIC	0.01MF		50V
C17	1-101-004-00	CERAMIC	0.01MF		50V
C18	1-101-004-00	CERAMIC	0.01MF		50V
C20	1-123-382-00	ELECT	3.3MF	20%	50V
C21	1-123-356-00	ELECT	10MF	20%	16V
C22	1-123-356-00	ELECT	10MF	20%	16V
C23	1-123-356-00	ELECT	10MF	20%	16V
C24	1-123-356-00	ELECT	10MF	20%	16V
C26	1-101-004-00	CERAMIC	0.01MF		50V
C41	1-124-122-11	ELECT	100MF	20%	16V
C42	1-123-356-00	ELECT	10MF	20%	16V
C43	1-123-356-00	ELECT	10MF	20%	16V
C44	1-123-356-00	ELECT	10MF	20%	16V
C45	1-123-356-00	ELECT	10MF	20%	16V
C50	1-123-356-00	ELECT	10MF	20%	16V
C51	1-101-004-00	CERAMIC	0.01MF		50V
C52	1-101-004-00	CERAMIC	0.01MF		50V
C53	1-101-004-00	CERAMIC	0.01MF		50V
C54	1-101-004-00	CERAMIC	0.01MF		50V
C55	1-101-004-00	CERAMIC	0.01MF		50V
C71	1-124-122-11	ELECT	100MF	20%	16V
C72	1-123-356-00	ELECT	10MF	20%	16V
C73	1-123-356-00	ELECT	10MF	20%	16V
C74	1-123-356-00	ELECT	10MF	20%	16V
C80	1-123-356-00	ELECT	10MF	20%	16V
C81	1-101-004-00	CERAMIC	0.01MF		50V
C82	1-101-004-00	CERAMIC	0.01MF		50V
C83	1-101-004-00	CERAMIC	0.01MF		50V
C84	1-101-004-00	CERAMIC	0.01MF		50V
C85	1-101-004-00	CERAMIC	0.01MF		50V
C86	1-101-004-00	CERAMIC	0.01MF		50V
C101	1-161-021-11	CERAMIC	0.047MF	10%	25V
C102	1-102-942-00	CERAMIC	5PF	0.5PF	50V
C103	1-102-959-00	CERAMIC	22PF	5%	50V
C104	1-123-356-00	ELECT	10MF	20%	16V
C105	1-161-021-11	CERAMIC	0.047MF	10%	25V
C106	1-101-004-00	CERAMIC	0.01MF		50V
C107	1-161-021-11	CERAMIC	0.047MF	10%	25V
C108	1-101-004-00	CERAMIC	0.01MF		50V
C109	1-101-004-00	CERAMIC	0.01MF		50V
C110	1-101-880-00	CERAMIC	47PF	5%	50V
C201	1-161-021-11	CERAMIC	0.047MF	10%	25V
C202	1-102-942-00	CERAMIC	5PF	0.5PF	50V
C203	1-102-959-00	CERAMIC	22PF	5%	50V
C204	1-123-356-00	ELECT	10MF	20%	16V
C205	1-161-021-11	CERAMIC	0.047MF	10%	25V
C206	1-101-004-00	CERAMIC	0.01MF		50V
C207	1-161-021-11	CERAMIC	0.047MF	10%	25V
C208	1-101-004-00	CERAMIC	0.01MF		50V
C209	1-101-004-00	CERAMIC	0.01MF		50V
C210	1-101-880-00	CERAMIC	47PF	5%	50V
C301	1-161-021-11	CERAMIC	0.047MF	10%	25V
C302	1-102-942-00	CERAMIC	5PF	0.5PF	50V
C303	1-102-959-00	CERAMIC	22PF	5%	50V
C304	1-123-356-00	ELECT	10MF	20%	16V
C305	1-161-021-11	CERAMIC	0.047MF	10%	25V
C306	1-101-004-00	CERAMIC	0.01MF		50V
C307	1-161-021-11	CERAMIC	0.047MF	10%	25V
C308	1-101-004-00	CERAMIC	0.01MF		50V
C309	1-101-004-00	CERAMIC	0.01MF		50V
C310	1-101-880-00	CERAMIC	47PF	5%	50V

COMBINATION PARTS

Ref.No	Part No.	Description
CP17	1-232-096-00	COMPOSITION CIRCUIT BLOCK

DIODE

Ref.No	Part No.	Description
D1	8-719-911-19	DIODE 1SS119
D101	8-719-911-19	DIODE 1SS119
D102	8-719-911-19	DIODE 1SS119
D201	8-719-911-19	DIODE 1SS119
D202	8-719-911-19	DIODE 1SS119
D301	8-719-911-19	DIODE 1SS119
D302	8-719-911-19	DIODE 1SS119

IC

Ref.No	Part No.	Description
IC1	8-759-040-53	IC TC4053BPHB
IC2	8-759-040-53	IC TC4053BPHB
IC3	8-759-040-53	IC TC4053BPHB
IC4	8-759-040-53	IC TC4053BPHB
IC5	8-759-981-95	IC RC4558S
IC6	8-759-981-95	IC RC4558S
IC7	8-759-800-81	IC LA7016
IC8	8-759-800-81	IC LA7016
IC9	8-759-040-53	IC MC14053BCP

BH

Ref.No	Part No.	Description	Remark
IC10	8-759-040-53	IC MC14053BCP	
IC11	8-759-240-81	IC TC4081BP	
IC12	8-759-140-81	IC TC4081BP	
IC13	8-759-040-01	IC TC14001BP	
IC14	8-759-207-73	IC TC4030BPHB	
IC101	8-766-001-49	TRANSISTOR TX-429M	
IC102	8-759-990-82	IC TL082CP	
IC201	8-766-001-49	TRANSISTOR TX-429M	
IC202	8-759-990-82	IC TL082CP	
IC301	8-766-001-49	TRANSISTOR TX-429M	
IC302	8-759-990-82	IC TL082CP	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q1	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q2	8-729-105-71	TRANSISTOR 2SK523-K2	
Q3	8-729-384-48	TRANSISTOR 2SA844-E	
Q4	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q5	8-729-105-71	TRANSISTOR 2SK523-K2	
Q6	8-729-384-48	TRANSISTOR 2SA844-E	
Q7	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q8	8-729-105-71	TRANSISTOR 2SK523-K2	
Q9	8-729-384-48	TRANSISTOR 2SA844-E	
Q10	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q11	8-729-105-71	TRANSISTOR 2SK523-K2	
Q12	8-729-384-48	TRANSISTOR 2SA844-E	
Q13	8-729-384-48	TRANSISTOR 2SA844-E	
Q14	8-729-384-48	TRANSISTOR 2SA844-E	
Q15	8-729-384-48	TRANSISTOR 2SA844-E	
Q16	8-729-800-10	TRANSISTOR 2SC3068	
Q101	8-729-600-19	TRANSISTOR 2SK381-A	
Q102	8-729-384-48	TRANSISTOR 2SA844-E	
Q103	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q104	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q105	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q106	8-729-600-19	TRANSISTOR 2SK381-A	
Q107	8-729-600-19	TRANSISTOR 2SK381-A	
Q108	8-729-600-19	TRANSISTOR 2SK381-A	
Q201	8-729-600-19	TRANSISTOR 2SK381-A	
Q202	8-729-384-48	TRANSISTOR 2SA844-E	
Q203	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q204	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q205	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q206	8-729-600-19	TRANSISTOR 2SK381-A	
Q207	8-729-600-19	TRANSISTOR 2SK381-A	
Q208	8-729-600-19	TRANSISTOR 2SK381-A	
Q301	8-729-600-19	TRANSISTOR 2SK381-A	
Q302	8-729-384-48	TRANSISTOR 2SA844-E	
Q303	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q304	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q305	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q306	8-729-600-19	TRANSISTOR 2SK381-A	
Q307	8-729-600-19	TRANSISTOR 2SK381-A	
Q308	8-729-600-19	TRANSISTOR 2SK381-A	

RESISTOR

Ref.No	Part No.	Description				Remark
R1	1-249-433-11	CARBON	22K	5%	1/4W	
R3	1-249-427-11	CARBON	6.8K	5%	1/4W	
R5	1-249-422-11	CARBON	2.7K	5%	1/4W	
R6	1-249-433-11	CARBON	22K	5%	1/4W	
R7	1-249-433-11	CARBON	22K	5%	1/4W	
R9	1-249-427-11	CARBON	6.8K	5%	1/4W	
R11	1-249-422-11	CARBON	2.7K	5%	1/4W	
R12	1-249-433-11	CARBON	22K	5%	1/4W	
R13	1-249-433-11	CARBON	22K	5%	1/4W	
R15	1-249-427-11	CARBON	6.8K	5%	1/4W	
R17	1-249-422-11	CARBON	2.7K	5%	1/4W	
R18	1-249-433-11	CARBON	22K	5%	1/4W	
R19	1-249-433-11	CARBON	22K	5%	1/4W	
R21	1-249-427-11	CARBON	6.8K	5%	1/4W	
R23	1-249-422-11	CARBON	2.7K	5%	1/4W	
R31	1-249-405-11	CARBON	100	5%	1/4W	
R32	1-249-405-11	CARBON	100	5%	1/4W	
R33	1-249-433-11	CARBON	22K	5%	1/4W	
R34	1-249-422-11	CARBON	2.7K	5%	1/4W	
R35	1-249-405-11	CARBON	100	5%	1/4W	
R36	1-249-405-11	CARBON	100	5%	1/4W	
R37	1-249-433-11	CARBON	22K	5%	1/4W	
R38	1-249-422-11	CARBON	2.7K	5%	1/4W	
R39	1-249-433-11	CARBON	22K	5%	1/4W	
R40	1-249-422-11	CARBON	2.7K	5%	1/4W	
R52	1-249-417-11	CARBON	1K	5%	1/4W	
R53	1-249-425-11	CARBON	4.7K	5%	1/4W	
R54	1-249-441-11	CARBON	100K	5%	1/4W	
R63	1-249-417-11	CARBON	1K	5%	1/4W	
R64	1-249-437-11	CARBON	47K	5%	1/4W	
R65	1-249-433-11	CARBON	22K	5%	1/4W	
R66	1-249-417-11	CARBON	1K	5%	1/4W	
R101	1-247-903-00	CARBON	1M	5%	1/4W	
R102	1-249-431-11	CARBON	15K	5%	1/4W	
R103	1-249-419-11	CARBON	1.5K	5%	1/4W	
R104	1-249-430-11	CARBON	12K	5%	1/4W	
R105	1-249-409-11	CARBON	220	5%	1/4W	
R106	1-249-419-11	CARBON	1.5K	5%	1/4W	
R107	1-215-425-00	METAL	1.5K	1%	1/4W	
R108	1-249-415-11	CARBON	680	5%	1/4W	
R109	1-249-419-11	CARBON	1.5K	5%	1/4W	
R110	1-215-427-00	METAL	1.8K	1%	1/4W	
R111	1-215-453-00	METAL	22K	1%	1/4W	
R112	1-249-419-11	CARBON	1.5K	5%	1/4W	
R113	1-249-405-11	CARBON	100	5%	1/4W	
R114	1-215-445-00	METAL	10K	1%	1/4W	
R115	1-215-445-00	METAL	10K	1%	1/4W	
R116	1-249-429-11	CARBON	10K	5%	1/4W	
R117	1-215-493-00	METAL	1M	1%	1/4W	
R120	1-215-451-00	METAL	18K	1%	1/4W	
R121	1-215-453-00	METAL	22K	1%	1/4W	
R201	1-247-903-00	CARBON	1M	5%	1/4W	
R202	1-249-431-11	CARBON	15K	5%	1/4W	
R203	1-249-419-11	CARBON	1.5K	5%	1/4W	
R204	1-249-430-11	CARBON	12K	5%	1/4W	
R205	1-249-409-11	CARBON	220	5%	1/4W	
R206	1-249-419-11	CARBON	1.5K	5%	1/4W	
R207	1-215-425-00	METAL	1.5K	1%	1/4W	
R208	1-249-415-11	CARBON	680	5%	1/4W	
R209	1-249-419-11	CARBON	1.5K	5%	1/4W	
R210	1-215-427-00	METAL	1.8K	1%	1/4W	
R211	1-215-453-00	METAL	22K	1%	1/4W	
R212	1-249-419-11	CARBON	1.5K	5%	1/4W	
R213	1-249-405-11	CARBON	100	5%	1/4W	
R214	1-215-445-00	METAL	10K	1%	1/4W	
R215	1-215-445-00	METAL	10K	1%	1/4W	
R216	1-249-429-11	CARBON	10K	5%	1/4W	
R217	1-215-455-00	METAL	27K	1%	1/4W	
R301	1-247-903-00	CARBON	1M	5%	1/4W	
R302	1-249-431-11	CARBON	15K	5%	1/4W	
R303	1-249-419-11	CARBON	1.5K	5%	1/4W	
R304	1-249-430-11	CARBON	12K	5%	1/4W	
R305	1-249-409-11	CARBON	220	5%	1/4W	
R306	1-249-419-11	CARBON	1.5K	5%	1/4W	
R307	1-215-425-00	METAL	1.5K	1%	1/4W	

Ref.No	Part No.	Description			Remark
R308	1-249-415-11	CARBON	680	5%	1/4W
R309	1-249-419-11	CARBON	1.5K	5%	1/4W
R310	1-215-427-00	METAL	1.8K	1%	1/4W
R311	1-215-453-00	METAL	22K	1%	1/4W
R312	1-249-419-11	CARBON	1.5K	5%	1/4W
R313	1-249-405-11	CARBON	100	5%	1/4W
R314	1-215-445-00	METAL	10K	1%	1/4W
R315	1-215-445-00	METAL	10K	1%	1/4W
R316	1-249-429-11	CARBON	10K	5%	1/4W

VARIABLE RESISTOR

Ref.No	Part No.	Description
RV1	1-237-505-21	RES, ADJ, CERMET 50K
RV2	1-237-505-21	RES, ADJ, CERMET 50K
RV3	1-237-505-21	RES, ADJ, CERMET 50K

SWITCH

Ref.No	Part No.	Description
S1	1-570-857-11	SWITCH, SLIDE
S2	1-570-851-11	SWITCH, SLIDE

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*A-1135-591-A BI BOARD, COMPLETE
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*4-353-708-00 HOOK, FINGER
7-682-547-04 SCREW BVTT 3X6 (S)

CAPACITOR

Ref.No	Part No.	Description			Remark
C1	1-130-481-00	MYLAR	0.0068MF	5%	50V
C2	1-136-165-00	FILM	0.1MF	5%	50V
C3	1-123-369-00	ELECT	4.7MF	20%	25V
C4	1-123-369-00	ELECT	4.7MF	20%	25V
C5	1-102-973-00	CERAMIC	100PF	5%	50V
C7	1-123-330-00	ELECT	22MF	20%	25V
C8	1-123-369-00	ELECT	4.7MF	20%	25V
C10	1-123-356-00	ELECT	10MF	20%	50V
C11	1-123-356-00	ELECT	10MF	20%	16V
C12	1-101-004-00	CERAMIC	0.01MF		50V
C13	1-101-004-00	CERAMIC	0.01MF		50V
C14	1-101-004-00	CERAMIC	0.01MF		50V
C15	1-123-330-00	ELECT	22MF	20%	16V
C16	1-123-356-00	ELECT	10MF	20%	16V
C17	1-101-004-00	CERAMIC	0.01MF		50V
C18	1-101-004-00	CERAMIC	0.01MF		50V
C19	1-101-004-00	CERAMIC	0.01MF		50V
C41	1-124-034-51	ELECT	33MF	20%	16V
C42	1-124-034-51	ELECT	33MF	20%	16V
C43	1-124-034-51	ELECT	33MF	20%	16V
C44	1-124-034-51	ELECT	33MF	20%	16V
C45	1-124-034-51	ELECT	33MF	20%	16V
C46	1-124-034-51	ELECT	33MF	20%	16V
C51	1-101-004-00	CERAMIC	0.01MF		50V
C52	1-101-004-00	CERAMIC	0.01MF		50V
C53	1-101-004-00	CERAMIC	0.01MF		50V
C54	1-101-004-00	CERAMIC	0.01MF		50V
C55	1-101-004-00	CERAMIC	0.01MF		50V
C56	1-101-004-00	CERAMIC	0.01MF		50V
C57	1-101-004-00	CERAMIC	0.01MF		50V
C71	1-124-034-51	ELECT	33MF	20%	16V
C72	1-124-034-51	ELECT	33MF	20%	16V
C73	1-124-034-51	ELECT	33MF	20%	16V
C74	1-124-034-51	ELECT	33MF	20%	16V
C75	1-124-034-51	ELECT	33MF	20%	16V
C76	1-124-034-51	ELECT	33MF	20%	16V
C81	1-101-004-00	CERAMIC	0.01MF		50V
C82	1-101-004-00	CERAMIC	0.01MF		50V

Ref.No	Part No.	Description			Remark
C83	1-101-004-00	CERAMIC	0.01MF		50V
C84	1-101-004-00	CERAMIC	0.01MF		50V
C85	1-101-004-00	CERAMIC	0.01MF		50V
C86	1-101-004-00	CERAMIC	0.01MF		50V
C87	1-101-004-00	CERAMIC	0.01MF		50V
C101	1-101-004-00	CERAMIC	0.01MF		50V
C104	1-123-356-00	ELECT	10MF	20%	16V
C105	1-101-004-00	CERAMIC	0.01MF		50V
C106	1-136-161-00	FILM	0.047MF	5%	50V
C107	1-102-937-00	CERAMIC	4PF	0.25PF	50V
C108	1-101-880-00	CERAMIC	47PF	5%	50V
C109	1-136-161-00	FILM	0.047MF	5%	50V
C110	1-136-161-00	FILM	0.047MF	5%	50V
C114	1-102-951-00	CERAMIC	15PF	5%	50V
C115	1-136-153-00	FILM	0.01MF	5%	50V
C116	1-102-973-00	CERAMIC	100PF	5%	50V
C117	1-101-004-00	CERAMIC	0.01MF		50V
C118	1-101-004-00	CERAMIC	0.01MF		50V
C119	1-102-953-00	CERAMIC	18PF	5%	50V
C120	1-102-973-00	CERAMIC	100PF	5%	50V
C122	1-102-961-00	CERAMIC	27PF	5%	50V
C201	1-101-004-00	CERAMIC	0.01MF		50V
C202	1-123-380-00	ELECT	1MF	20%	50V
C204	1-123-356-00	ELECT	10MF	20%	16V
C205	1-101-004-00	CERAMIC	0.01MF		50V
C206	1-136-161-00	FILM	0.047MF	5%	50V
C207	1-102-937-00	CERAMIC	4PF	0.25PF	50V
C208	1-101-880-00	CERAMIC	47PF	5%	50V
C209	1-136-161-00	FILM	0.047MF	5%	50V
C210	1-136-161-00	FILM	0.047MF	5%	50V
C214	1-102-951-00	CERAMIC	15PF	5%	50V
C215	1-136-153-00	FILM	0.01MF	5%	50V
C216	1-102-973-00	CERAMIC	100PF	5%	50V
C217	1-101-004-00	CERAMIC	0.01MF		50V
C218	1-101-004-00	CERAMIC	0.01MF		50V
C219	1-102-953-00	CERAMIC	18PF	5%	50V
C220	1-102-973-00	CERAMIC	100PF	5%	50V
C222	1-102-961-00	CERAMIC	27PF	5%	50V
C301	1-101-004-00	CERAMIC	0.01MF		50V
C302	1-123-380-00	ELECT	1MF	20%	50V
C304	1-123-356-00	ELECT	10MF	20%	16V
C305	1-101-004-00	CERAMIC	0.01MF		50V
C306	1-136-161-00	FILM	0.047MF	5%	50V
C307	1-102-937-00	CERAMIC	4PF	0.25PF	50V
C308	1-101-880-00	CERAMIC	47PF	5%	50V
C309	1-136-161-00	FILM	0.047MF	5%	50V
C310	1-136-161-00	FILM	0.047MF	5%	50V
C314	1-102-951-00	CERAMIC	15PF	5%	50V
C315	1-136-153-00	FILM	0.01MF	5%	50V
C316	1-102-973-00	CERAMIC	100PF	5%	50V
C317	1-101-004-00	CERAMIC	0.01MF		50V
C318	1-101-004-00	CERAMIC	0.01MF		50V
C319	1-102-953-00	CERAMIC	18PF	5%	50V
C320	1-102-973-00	CERAMIC	100PF	5%	50V
C322	1-102-961-00	CERAMIC	27PF	5%	50V

DIODE

Ref.No	Part No.	Description
D1	8-719-911-19	DIODE 1SS119
D2	8-719-911-19	DIODE 1SS119
D4	8-719-911-19	DIODE 1SS119
D5	8-719-911-19	DIODE 1SS119
D6	8-719-110-31	DIODE RD12ES-B2
D7	8-719-911-19	DIODE 1SS119
D8	8-719-911-19	DIODE 1SS119
D8	8-719-911-19	DIODE 1SS119
D101	8-719-911-19	DIODE 1SS119

BI

Ref.No	Part No.	Description	Remark
D102	8-719-016-42	DIODE MC932	
D103	8-719-109-74	DIODE RD4.3ES-B1	
D104	8-719-911-19	DIODE 1SS119	
D105	8-719-109-93	DIODE RD6.2ES-B2	
D201	8-719-911-19	DIODE 1SS119	
D202	8-719-016-42	DIODE MC932	
D203	8-719-109-74	DIODE RD4.3ES-B1	
D204	8-719-911-19	DIODE 1SS119	
D205	8-719-109-93	DIODE RD6.2ES-B2	
D301	8-719-911-19	DIODE 1SS119	
D302	8-719-016-42	DIODE MC932	
D303	8-719-109-74	DIODE RD4.3ES-B1	
D304	8-719-911-19	DIODE 1SS119	
D305	8-719-109-93	DIODE RD6.2ES-B2	

IC

Ref.No	Part No.	Description	Remark
IC1	8-759-945-58	IC RC4558P	
IC101	8-759-040-53	IC MC14053BCP	
IC102	8-766-001-49	TRANSISTOR TX-429M	
IC103	8-759-990-82	IC TL082CP	
IC104	8-759-990-82	IC TL082CP	
IC105	8-759-990-82	IC TL082CP	
IC201	8-759-040-53	IC MC14053BCP	
IC202	8-766-001-49	TRANSISTOR TX-429M	
IC203	8-759-990-82	IC TL082CP	
IC204	8-759-990-82	IC TL082CP	
IC205	8-759-990-82	IC TL082CP	
IC301	8-759-040-53	IC MC14053BCP	
IC302	8-766-001-49	TRANSISTOR TX-429M	
IC303	8-759-990-82	IC TL082CP	
IC304	8-759-990-82	IC TL082CP	
IC305	8-759-990-82	IC TL082CP	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q1	8-729-900-74	TRANSISTOR DTC143TS	
Q2	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q3	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q11	8-729-201-05	TRANSISTOR 2SC2878-B	
Q12	8-729-201-05	TRANSISTOR 2SC2878-B	
Q13	8-729-201-05	TRANSISTOR 2SC2878-B	
Q14	8-729-201-05	TRANSISTOR 2SC2878-B	
Q15	8-729-926-33	TRANSISTOR XDA144ES	
Q101	8-729-384-48	TRANSISTOR 2SA844-E	
Q102	8-729-384-48	TRANSISTOR 2SA844-E	
Q103	8-729-384-48	TRANSISTOR 2SA844-E	
Q105	8-729-600-19	TRANSISTOR 2SK381-A	
Q106	8-729-384-48	TRANSISTOR 2SA844-E	
Q107	8-729-266-82	TRANSISTOR 2SC2668-O	
Q108	8-729-384-48	TRANSISTOR 2SA844-E	
Q109	8-729-600-19	TRANSISTOR 2SK381-A	
Q110	8-729-600-19	TRANSISTOR 2SK381-A	
Q113	8-729-600-19	TRANSISTOR 2SK381-A	
Q114	8-729-200-17	TRANSISTOR 2SA1091-O	
Q201	8-729-384-48	TRANSISTOR 2SA844-E	
Q202	8-729-384-48	TRANSISTOR 2SA844-E	
Q203	8-729-384-48	TRANSISTOR 2SA844-E	
Q205	8-729-600-19	TRANSISTOR 2SK381-A	
Q206	8-729-384-48	TRANSISTOR 2SA844-E	
Q207	8-729-266-82	TRANSISTOR 2SC2668-O	
Q208	8-729-384-48	TRANSISTOR 2SA844-E	
Q209	8-729-600-19	TRANSISTOR 2SK381-A	
Q210	8-729-600-19	TRANSISTOR 2SK381-A	
Q213	8-729-600-19	TRANSISTOR 2SK381-A	
Q214	8-729-200-17	TRANSISTOR 2SA1091-O	
Q301	8-729-384-48	TRANSISTOR 2SA844-E	
Q302	8-729-384-48	TRANSISTOR 2SA844-E	
Q303	8-729-384-48	TRANSISTOR 2SA844-E	
Q305	8-729-600-19	TRANSISTOR 2SK381-A	
Q306	8-729-384-48	TRANSISTOR 2SA844-E	
Q307	8-729-266-82	TRANSISTOR 2SC2668-O	
Q308	8-729-384-48	TRANSISTOR 2SA844-E	
Q309	8-729-600-19	TRANSISTOR 2SK381-A	
Q310	8-729-600-19	TRANSISTOR 2SK381-A	
Q313	8-729-600-19	TRANSISTOR 2SK381-A	
Q314	8-729-200-17	TRANSISTOR 2SA1091-O	

RESISTOR

Ref.No	Part No.	Description				Remark
R1	1-247-903-00	CARBON	1M	5%	1/4W	
R2	1-249-429-11	CARBON	10K	5%	1/4W	
R3	1-215-493-00	METAL	1M	1%	1/4W	
R4	1-215-469-00	METAL	100K	1%	1/4W	
R5	1-249-435-11	CARBON	33K	5%	1/4W	
R8	1-249-435-11	CARBON	33K	5%	1/4W	
R9	1-249-424-11	CARBON	3.9K	5%	1/4W	
R10	1-249-425-11	CARBON	4.7K	5%	1/4W	
R11	1-249-435-11	CARBON	33K	5%	1/4W	
R12	1-249-429-11	CARBON	10K	5%	1/4W	
R13	1-249-425-11	CARBON	4.7K	5%	1/4W	
R14	1-249-435-11	CARBON	33K	5%	1/4W	
R15	1-249-429-11	CARBON	10K	5%	1/4W	
R23	1-249-417-11	CARBON	1K	5%	1/4W	
R24	1-249-417-11	CARBON	1K	5%	1/4W	
R25	1-249-417-11	CARBON	1K	5%	1/4W	
R31	1-249-430-11	CARBON	12K	5%	1/4W	
R32	1-249-436-11	CARBON	39K	5%	1/4W	
R33	1-249-430-11	CARBON	12K	5%	1/4W	
R51	1-249-417-11	CARBON	1K	5%	1/4W	
R52	1-249-417-11	CARBON	1K	5%	1/4W	
R53	1-249-417-11	CARBON	1K	5%	1/4W	
R54	1-249-431-11	CARBON	15K	5%	1/4W	
R55	1-249-437-11	CARBON	47K	5%	1/4W	
R56	1-249-431-11	CARBON	15K	5%	1/4W	
R57	1-249-431-11	CARBON	15K	5%	1/4W	
R58	1-249-439-11	CARBON	68K	5%	1/4W	
R60	1-215-465-00	METAL	68K	1%	1/4W	
R61	1-215-445-00	METAL	10K	1%	1/4W	
R101	1-249-441-11	CARBON	100K	5%	1/4W	
R102	1-249-421-11	CARBON	2.2K	5%	1/4W	
R104	1-215-469-00	METAL	100K	1%	1/4W	
R105	1-215-476-00	METAL	200K	1%	1/4W	
R106	1-215-427-00	METAL	1.8K	1%	1/4W	
R107	1-249-435-11	CARBON	33K	5%	1/4W	
R108	1-249-430-11	CARBON	12K	5%	1/4W	
R109	1-249-417-11	CARBON	1K	5%	1/4W	
R110	1-249-441-11	CARBON	100K	5%	1/4W	
R111	1-249-417-11	CARBON	1K	5%	1/4W	
R113	1-247-903-00	CARBON	1M	5%	1/4W	
R114	1-249-419-11	CARBON	1.5K	5%	1/4W	
R115	1-249-419-11	CARBON	1.5K	5%	1/4W	
R116	1-249-424-11	CARBON	3.9K	5%	1/4W	
R117	1-249-419-11	CARBON	1.5K	5%	1/4W	
R118	1-215-421-00	METAL	1K	1%	1/4W	
R119	1-249-405-11	CARBON	100	5%	1/4W	
R120	1-249-405-11	CARBON	100	5%	1/4W	
R121	1-249-409-11	CARBON	220	5%	1/4W	
R122	1-215-425-00	METAL	1.5K	1%	1/4W	
R123	1-249-429-11	CARBON	10K	5%	1/4W	
R124	1-249-429-11	CARBON	10K	5%	1/4W	
R125	1-249-422-11	CARBON	2.7K	5%	1/4W	
R127	1-215-445-00	METAL	10K	1%	1/4W	
R128	1-215-445-00	METAL	10K	1%	1/4W	

Ref.No	Part No.	Description			Remark
R136	1-215-477-00	METAL	220K	1%	1/4W
R137	1-249-417-11	CARBON	1K	5%	1/4W
R138	1-249-441-11	CARBON	100K	5%	1/4W
R140	1-249-429-11	CARBON	10K	5%	1/4W
R141	1-215-469-00	METAL	100K	1%	1/4W
R142	1-215-459-00	METAL	39K	1%	1/4W
R143	1-215-488-00	METAL	620K	1%	1/4W
R144	1-249-434-11	CARBON	27K	5%	1/4W
R145	1-249-429-11	CARBON	10K	5%	1/4W
R146	1-249-429-11	CARBON	10K	5%	1/4W
R147	1-249-405-11	CARBON	100	5%	1/4W
R150	1-249-405-11	CARBON	100	5%	1/4W
R201	1-249-441-11	CARBON	100K	5%	1/4W
R202	1-249-421-11	CARBON	2.2K	5%	1/4W
R204	1-215-469-00	METAL	100K	1%	1/4W
R205	1-215-476-00	METAL	200K	1%	1/4W
R206	1-215-427-00	METAL	1.8K	1%	1/4W
R207	1-249-435-11	CARBON	33K	5%	1/4W
R208	1-249-430-11	CARBON	12K	5%	1/4W
R209	1-249-417-11	CARBON	1K	5%	1/4W
R210	1-249-441-11	CARBON	100K	5%	1/4W
R211	1-249-417-11	CARBON	1K	5%	1/4W
R213	1-247-903-00	CARBON	1M	5%	1/4W
R214	1-249-419-11	CARBON	1.5K	5%	1/4W
R215	1-249-419-11	CARBON	1.5K	5%	1/4W
R216	1-249-424-11	CARBON	3.9K	5%	1/4W
R217	1-249-419-11	CARBON	1.5K	5%	1/4W
R218	1-215-421-00	METAL	1K	1%	1/4W
R219	1-249-405-11	CARBON	100	5%	1/4W
R220	1-249-405-11	CARBON	100	5%	1/4W
R221	1-249-409-11	CARBON	220	5%	1/4W
R222	1-215-425-00	METAL	1.5K	1%	1/4W
R223	1-249-429-11	CARBON	10K	5%	1/4W
R224	1-249-429-11	CARBON	10K	5%	1/4W
R225	1-249-422-11	CARBON	2.7K	5%	1/4W
R227	1-215-445-00	METAL	10K	1%	1/4W
R228	1-215-445-00	METAL	10K	1%	1/4W
R236	1-215-477-00	METAL	220K	1%	1/4W
R237	1-249-417-11	CARBON	1K	5%	1/4W
R238	1-249-441-11	CARBON	100K	5%	1/4W
R240	1-249-429-11	CARBON	10K	5%	1/4W
R241	1-215-469-00	METAL	100K	1%	1/4W
R242	1-215-459-00	METAL	39K	1%	1/4W
R243	1-215-488-00	METAL	620K	1%	1/4W
R244	1-249-434-11	CARBON	27K	5%	1/4W
R245	1-249-429-11	CARBON	10K	5%	1/4W
R246	1-249-429-11	CARBON	10K	5%	1/4W
R247	1-249-405-11	CARBON	100	5%	1/4W
R250	1-249-405-11	CARBON	100	5%	1/4W
R301	1-249-441-11	CARBON	100K	5%	1/4W
R302	1-249-421-11	CARBON	2.2K	5%	1/4W
R304	1-215-469-00	METAL	100K	1%	1/4W
R305	1-215-476-00	METAL	200K	1%	1/4W
R306	1-215-427-00	METAL	1.8K	1%	1/4W
R307	1-249-435-11	CARBON	33K	5%	1/4W
R308	1-249-430-11	CARBON	12K	5%	1/4W
R309	1-249-417-11	CARBON	1K	5%	1/4W
R310	1-249-441-11	CARBON	100K	5%	1/4W
R311	1-249-417-11	CARBON	1K	5%	1/4W
R313	1-247-903-00	CARBON	1M	5%	1/4W
R314	1-249-419-11	CARBON	1.5K	5%	1/4W
R315	1-249-419-11	CARBON	1.5K	5%	1/4W
R316	1-249-424-11	CARBON	3.9K	5%	1/4W
R317	1-249-419-11	CARBON	1.5K	5%	1/4W
R318	1-215-421-00	METAL	1K	1%	1/4W
R319	1-249-405-11	CARBON	100	5%	1/4W
R320	1-249-405-11	CARBON	100	5%	1/4W
R321	1-249-409-11	CARBON	220	5%	1/4W
R322	1-215-425-00	METAL	1.5K	1%	1/4W
R323	1-249-429-11	CARBON	10K	5%	1/4W
R324	1-249-429-11	CARBON	10K	5%	1/4W
R325	1-249-422-11	CARBON	2.7K	5%	1/4W
R327	1-215-445-00	METAL	10K	1%	1/4W
R328	1-215-445-00	METAL	10K	1%	1/4W
R336	1-215-477-00	METAL	220K	1%	1/4W
R337	1-249-417-11	CARBON	1K	5%	1/4W
R338	1-249-441-11	CARBON	100K	5%	1/4W
R340	1-249-429-11	CARBON	10K	5%	1/4W
R341	1-215-469-00	METAL	100K	1%	1/4W
R342	1-215-459-00	METAL	39K	1%	1/4W
R343	1-215-488-00	METAL	620K	1%	1/4W
R344	1-249-434-11	CARBON	27K	5%	1/4W
R345	1-249-429-11	CARBON	10K	5%	1/4W
R346	1-249-429-11	CARBON	10K	5%	1/4W
R347	1-249-405-11	CARBON	100	5%	1/4W
R350	1-249-405-11	CARBON	100	5%	1/4W

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*A-1135-361-A BJ BOARD, COMPLETE
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*4-353-708-00 HOOK, FINGER
7-682-547-04 SCREW BVTT 3X6 (S)

CAPACITOR

C1	1-101-361-00	CERAMIC	150PF	5%	50V
C2	1-101-361-00	CERAMIC	150PF	5%	50V
C4	1-102-821-00	CERAMIC	360PF	5%	50V
C5	1-130-473-00	MYLAR	0.0015MF	5%	50V
C11	1-104-302-11	POLYSTYRENE	0.001MF	5%	50V
C12	1-102-525-11	CERAMIC	68PF	5%	50V
C14	1-102-525-11	CERAMIC	68PF	5%	50V
C15	1-102-525-11	CERAMIC	68PF	5%	50V
C16	1-102-525-11	CERAMIC	68PF	5%	50V
C17	1-102-525-11	CERAMIC	68PF	5%	50V
C18	1-104-302-11	POLYSTYRENE	0.001MF	5%	50V
C19	1-102-973-00	CERAMIC	100PF	5%	50V
C20	1-102-525-11	CERAMIC	68PF	5%	50V
C21	1-101-361-00	CERAMIC	150PF	5%	50V
C22	1-101-890-00	CERAMIC	75PF	5%	50V
C23	1-102-965-00	CERAMIC	39PF	5%	50V
C25	1-102-811-	CERAMIC	9PF	1PF	50V
C26	1-102-944-00	CERAMIC	7PF	1PF	50V
C27	1-101-361-00	CERAMIC	150PF	5%	50V
C28	1-130-471-00	MYLAR	0.001MF	5%	50V
C29	1-130-471-00	MYLAR	0.001MF	5%	50V
C30	1-101-004-00	CERAMIC	0.01MF		50V
C31	1-101-361-00	CERAMIC	150PF	5%	50V
C32	1-101-361-00	CERAMIC	150PF	5%	50V
C33	1-101-361-00	CERAMIC	150PF	5%	50V
C34	1-101-361-00	CERAMIC	150PF	5%	50V
C35	1-130-471-00	MYLAR	0.001MF	5%	50V
C36	1-102-824-00	CERAMIC	470PF	5%	50V
C37	1-123-380-00	ELECT	1MF	20%	50V
C38	1-101-004-00	CERAMIC	0.01MF		50V
C39	1-101-004-00	CERAMIC	0.01MF		50V
C40	1-102-074-00	CERAMIC	0.001MF	10%	50V
C61	1-101-888-00	CERAMIC	68PF	5%	50V
C62	1-101-880-00	CERAMIC	47PF	5%	50V
C63	1-101-888-00	CERAMIC	68PF	5%	50V

BJ

Ref.No	Part No.	Description			Remark
C64	1-101-880-00	CERAMIC	47PF	5%	50V
C65	1-102-820-00	CERAMIC	330PF	5%	50V
C66	1-101-004-00	CERAMIC	0.01MF		50V
C67	1-101-880-00	CERAMIC	47PF	5%	50V
C100	1-124-910-11	ELECT	47MF	20%	16V
C102	1-124-034-51	ELECT	33MF	20%	16V
C106	1-101-004-00	CERAMIC	0.01MF		50V
C108	1-124-034-51	ELECT	33MF	20%	16V
C109	1-101-004-00	CERAMIC	0.01MF		50V
C110	1-101-004-00	CERAMIC	0.01MF		50V
C111	1-101-004-00	CERAMIC	0.01MF		50V
C112	1-101-004-00	CERAMIC	0.01MF		50V
C113	1-101-004-00	CERAMIC	0.01MF		50V
C114	1-123-356-00	ELECT	10MF	20%	16V
C115	1-101-004-00	CERAMIC	0.01MF		50V
C116	1-101-004-00	CERAMIC	0.01MF		50V
C117	1-101-004-00	CERAMIC	0.01MF		50V
C118	1-123-356-00	ELECT	10MF	20%	16V
C120	1-101-004-00	CERAMIC	0.01MF		50V
C121	1-101-004-00	CERAMIC	0.01MF		50V
C122	1-101-004-00	CERAMIC	0.01MF		50V
C130	1-124-034-51	ELECT	33MF	20%	16V

DIODE

D1	8-719-911-19	DIODE 1SS119
D2	8-719-911-19	DIODE 1SS119
D3	8-719-911-19	DIODE 1SS119
D7	8-719-911-19	DIODE 1SS119
D8	8-719-911-19	DIODE 1SS119
D9	8-719-911-19	DIODE 1SS119
D11	8-719-016-42	DIODE MC932

IC

IC1	8-759-345-38	IC HD14538BP
IC2	8-759-040-01	IC MC14001BP
IC3	8-759-240-40	IC TC4040BP
IC4	8-759-240-40	IC TC4040BP
IC5	8-759-000-35	IC MC14027BCP
IC6	8-759-000-35	IC MC14027BCP
IC7	8-759-000-35	IC MC14027BCP
IC8	8-759-000-35	IC MC14027BCP
IC9	8-759-000-35	IC MC14027BCP
IC10	8-759-345-38	IC HD14538BP
IC11	8-759-345-38	IC HD14538BP
IC12	8-759-345-38	IC HD14538BP
IC13	8-759-240-01	IC TC4001BP
IC14	8-759-240-01	IC TC4001BP
IC15	8-759-240-71	IC TC4071BP
IC16	8-759-140-11	IC MC14071BCP
IC17	8-759-140-11	IC MC14011BCP
IC18	8-759-000-32	IC MC14023BCP
IC19	8-759-240-81	IC TC4081BP
IC20	8-759-240-81	IC TC4081BP
IC21	8-759-240-71	IC TC4071BP
IC22	8-759-240-71	IC TC4071BP
IC23	8-759-240-73	IC MC14073BCP
IC24	8-759-240-69	IC MC14069UBCP
IC25	8-759-240-69	IC MC14069UBCP
IC26	8-759-041-75	IC MC14175BCP
IC27	8-759-040-53	IC MC14053BCP
IC28	8-759-000-77	IC MC14520BCP
IC29	8-759-345-38	IC HD14538BP

Ref.No	Part No.	Description			Remark

COIL

L1	1-408-098-00	INDUCTOR	560UH
L2	1-408-098-00	INDUCTOR	560UH
L3	1-408-100-00	INDUCTOR	680UH

TRANSISTOR

Q14	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q15	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q16	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q17	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q18	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q19	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q20	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q21	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q22	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q23	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q24	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q25	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q26	8-729-119-78	TRANSISTOR 2SC2785-HFE

RESISTOR

R2	1-215-439-00	METAL	5.6K	1%	1/4W
R3	1-249-422-11	CARBON	2.7K	5%	1/4W
R4	1-215-449-00	METAL	15K	1%	1/4W
R5	1-249-441-11	CARBON	100K	5%	1/4W
R6	1-249-425-11	CARBON	4.7K	5%	1/4W
R7	1-215-439-00	METAL	5.6K	1%	1/4W
R37	1-249-441-11	CARBON	100K	5%	1/4W
R38	1-215-454-00	METAL	24K	1%	1/4W
R39	1-249-422-11	CARBON	2.7K	5%	1/4W
R42	1-249-433-11	CARBON	22K	5%	1/4W
R43	1-247-876-11	CARBON	75K	5%	1/4W
R44	1-249-429-11	CARBON	10K	5%	1/4W
R45	1-249-441-11	CARBON	100K	5%	1/4W
R46	1-249-441-11	CARBON	100K	5%	1/4W
R47	1-247-862-11	CARBON	20K	5%	1/4W
R48	1-215-467-00	METAL	82K	1%	1/4W
R49	1-249-422-11	CARBON	2.7K	5%	1/4W
R50	1-215-469-00	METAL	100K	1%	1/4W
R51	1-215-445-00	METAL	10K	1%	1/4W
R52	1-247-885-00	CARBON	180K	5%	1/4W
R53	1-215-449-00	METAL	15K	1%	1/4W
R54	1-249-422-11	CARBON	2.7K	5%	1/4W
R56	1-249-434-11	CARBON	27K	5%	1/4W
R57	1-249-422-11	CARBON	2.7K	5%	1/4W
R58	1-249-425-11	CARBON	4.7K	5%	1/4W
R59	1-247-836-11	CARBON	1.6K	5%	1/4W
R60	1-249-427-11	CARBON	6.8K	5%	1/4W
R61	1-215-449-00	METAL	15K	1%	1/4W
R62	1-249-433-11	CARBON	22K	5%	1/4W
R63	1-249-425-11	CARBON	4.7K	5%	1/4W
R64	1-249-425-11	CARBON	4.7K	5%	1/4W
R65	1-249-417-11	CARBON	1K	5%	1/4W
R66	1-249-430-11	CARBON	12K	5%	1/4W
R67	1-249-425-11	CARBON	4.7K	5%	1/4W
R68	1-249-433-11	CARBON	22K	5%	1/4W
R69	1-249-425-11	CARBON	4.7K	5%	1/4W
R70	1-249-417-11	CARBON	1K	5%	1/4W
R71	1-249-430-11	CARBON	12K	5%	1/4W
R72	1-249-433-11	CARBON	22K	5%	1/4W
R74	1-249-430-11	CARBON	12K	5%	1/4W
R75	1-249-422-11	CARBON	2.7K	5%	1/4W
R76	1-215-463-00	METAL	56K	1%	1/4W
R77	1-215-475-00	METAL	180K	1%	1/4W
R78	1-215-439-00	METAL	5.6K	1%	1/4W

Ref.No	Part No.	Description			Remark
R79	1-249-425-11	CARBON	4.7K	5%	1/4W
R80	1-249-433-11	CARBON	22K	5%	1/4W
R81	1-249-425-11	CARBON	4.7K	5%	1/4W
R82	1-249-415-11	CARBON	680	5%	1/4W
R83	1-249-417-11	CARBON	1K	5%	1/4W
R85	1-249-430-11	CARBON	12K	5%	1/4W
R87	1-249-422-11	CARBON	2.7K	5%	1/4W
R89	1-247-887-00	CARBON	220K	5%	1/4W
R90	1-249-441-11	CARBON	100K	5%	1/4W
R91	1-249-441-11	CARBON	100K	5%	1/4W
R92	1-249-441-11	CARBON	100K	5%	1/4W
R93	1-249-429-11	CARBON	10K	5%	1/4W
R94	1-249-429-11	CARBON	10K	5%	1/4W
R95	1-249-441-11	CARBON	100K	5%	1/4W
R96	1-249-417-11	CARBON	1K	5%	1/4W
R100	1-249-423-11	CARBON	3.3K	5%	1/4W
R111	1-249-427-11	CARBON	6.8K	5%	1/4W
R112	1-249-429-11	CARBON	10K	5%	1/4W
R113	1-249-429-11	CARBON	10K	5%	1/4W
R114	1-249-422-11	CARBON	2.7K	5%	1/4W
R115	1-249-419-11	CARBON	1.5K	5%	1/4W
R116	1-249-427-11	CARBON	6.8K	5%	1/4W
R117	1-249-429-11	CARBON	10K	5%	1/4W
R118	1-249-429-11	CARBON	10K	5%	1/4W
R119	1-249-422-11	CARBON	2.7K	5%	1/4W
R120	1-249-419-11	CARBON	1.5K	5%	1/4W
R121	1-249-417-11	CARBON	1K	5%	1/4W
R122	1-249-417-11	CARBON	1K	5%	1/4W
R123	1-249-413-11	CARBON	470	5%	1/4W
R124	1-249-417-11	CARBON	1K	5%	1/4W
R125	1-249-417-11	CARBON	1K	5%	1/4W
R126	1-249-417-11	CARBON	1K	5%	1/4W
R127	1-249-417-11	CARBON	1K	5%	1/4W
R128	1-249-417-11	CARBON	1K	5%	1/4W
R129	1-249-417-11	CARBON	1K	5%	1/4W

VARIABLE RESISTOR

RV1	1-237-504-21	RES, ADJ, CERMET 20K			
RV3	1-237-504-21	RES, ADJ, CERMET 20K			
RV4	1-237-503-21	RES, ADJ, CERMET 10K			
RV5	1-237-506-21	RES, ADJ, CERMET 100K			
RV6	1-237-505-21	RES, ADJ, CERMET 50K			
RV7	1-237-504-21	RES, ADJ, CERMET 20K			
RV8	1-237-504-21	RES, ADJ, CERMET 20K			
RV9	1-237-505-21	RES, ADJ, CERMET 50K			

SWITCH

S1	1-570-857-11	SWITCH, SLIDE			

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*A-1135-523-A BK BOARD, COMPLETE

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	*4-353-770-00	HEAT SINK (TYPE 220)			
	7-682-948-01	SCREW PSW 3X8			
	7-682-548-04	SCREW BVTT 3X8 (S)			

CONNECTOR

BK1	*1-566-056-11	PIN, CONNECTOR 4P			
BK2	*1-566-056-11	PIN, CONNECTOR 4P			
BK3	*1-566-056-11	PIN, CONNECTOR 4P			
BK4	*1-566-055-11	PIN, CONNECTOR 3P			
BK5	*1-566-057-11	PIN, CONNECTOR 5P			
BK6	*1-566-043-11	PIN, CONNECTOR 4P			
BK7	*1-566-043-11	PIN, CONNECTOR 4P			
BK8	*1-566-043-11	PIN, CONNECTOR 4P			
BK9	*1-566-054-11	PIN, CONNECTOR 2P			
BK10	*1-566-054-11	PIN, CONNECTOR 2P			
BK11	*1-566-054-11	PIN, CONNECTOR 2P			
BK12	*1-566-056-11	PIN, CONNECTOR 4P			
BK13	*1-566-054-11	PIN, CONNECTOR 2P			

CAPACITOR

Ref.No	Part No.	Description			Remark
C1	1-124-482-11	ELECT	33MF	20%	25V
C5	1-124-482-11	ELECT	33MF	20%	25V
C6	1-101-004-00	CERAMIC	0.01MF		50V
C11	1-124-482-11	ELECT	33MF	20%	25V
C12	1-101-001-00	CERAMIC	0.001MF		50V
C15	1-123-939-00	ELECT	10MF	20%	200V
C16	1-102-050-00	CERAMIC	0.01MF	99%	500V
C20	1-124-482-11	ELECT	33MF	20%	25V
C21	1-123-939-00	ELECT	10MF	20%	200V
C25	1-108-704-11	MYLAR	0.1MF	10%	200V
C31	1-136-153-00	FILM	0.01MF	5%	50V
C101	1-102-525-11	CERAMIC	68PF	5%	50V
C102	1-102-973-00	CERAMIC	100PF	5%	50V
C103	1-124-341-00	ELECT	1MF	20%	200V
C106	1-102-038-00	CERAMIC	0.001MF		500V
C107	1-102-038-00	CERAMIC	0.001MF		500V
C109	1-124-478-11	ELECT	100MF	20%	25V
C110	1-101-004-00	CERAMIC	0.01MF		50V
C111	1-124-482-11	ELECT	33MF	20%	25V
C112	1-101-004-00	CERAMIC	0.01MF		50V
C113	1-124-482-11	ELECT	33MF	20%	25V
C114	1-102-050-00	CERAMIC	0.01MF	99%	500V
C115	1-123-939-00	ELECT	10MF	20%	200V
C201	1-102-525-11	CERAMIC	68PF	5%	50V
C202	1-102-973-00	CERAMIC	100PF	5%	50V
C203	1-124-341-00	ELECT	1MF	20%	200V
C206	1-102-038-00	CERAMIC	0.001MF		500V
C207	1-102-038-00	CERAMIC	0.001MF		500V
C209	1-124-478-11	ELECT	100MF	20%	25V
C210	1-101-004-00	CERAMIC	0.01MF		50V
C211	1-124-482-11	ELECT	33MF	20%	25V
C212	1-101-004-00	CERAMIC	0.01MF		50V
C213	1-124-482-11	ELECT	33MF	20%	25V
C214	1-102-050-00	CERAMIC	0.01MF	99%	500V
C215	1-123-939-00	ELECT	10MF	20%	200V
C301	1-102-525-11	CERAMIC	68PF	5%	50V
C302	1-102-973-00	CERAMIC	100PF	5%	50V
C303	1-124-341-00	ELECT	1MF	20%	200V
C306	1-102-038-00	CERAMIC	0.001MF		500V
C307	1-102-038-00	CERAMIC	0.001MF		500V
C309	1-124-478-11	ELECT	100MF	20%	25V
C310	1-101-004-00	CERAMIC	0.01MF		50V
C311	1-124-482-11	ELECT	33MF	20%	25V
C312	1-101-004-00	CERAMIC	0.01MF		50V
C313	1-124-482-11	ELECT	33MF	20%	25V
C314	1-102-050-00	CERAMIC	0.01MF	99%	500V
C315	1-123-939-00	ELECT	10MF	20%	200V

VARIABLE CAPACITOR

CV101	1-141-171-00	CAP,TRIMMER 15P			
CV201	1-141-171-00	CAP,TRIMMER 15P			
CV301	1-141-171-00	CAP,TRIMMER 15P			

DIODE

D1	8-719-911-19	DIODE 1SS119			
D2	8-719-911-19	DIODE 1SS119			
D12	8-719-901-83	DIODE 1SS83			

Ref.No	Part No.	Description	Remark
D13	8-719-901-83	DIODE 1SS83	
D14	8-719-901-83	DIODE 1SS83	
D15	8-719-110-53	DIODE RD20ES-B2	
D20	8-719-911-19	DIODE 1SS119	
D21	8-719-911-19	DIODE 1SS119	
D22	8-719-911-19	DIODE 1SS119	
D23	8-719-911-19	DIODE 1SS119	
D30	8-719-911-19	DIODE 1SS119	
D101	8-719-901-83	DIODE 1SS83	
D102	8-719-901-83	DIODE 1SS83	
D103	8-719-911-19	DIODE 1SS119	
D104	8-719-911-19	DIODE 1SS119	
D105	8-719-911-19	DIODE 1SS119	
D201	8-719-901-83	DIODE 1SS83	
D202	8-719-901-83	DIODE 1SS83	
D203	8-719-911-19	DIODE 1SS119	
D204	8-719-911-19	DIODE 1SS119	
D205	8-719-911-19	DIODE 1SS119	
D301	8-719-901-83	DIODE 1SS83	
D302	8-719-901-83	DIODE 1SS83	
D303	8-719-911-19	DIODE 1SS119	
D304	8-719-911-19	DIODE 1SS119	
D305	8-719-911-19	DIODE 1SS119	

IC

Ref.No	Part No.	Description	Remark
IC1	8-759-145-58	IC UPC4558C	

COIL

Ref.No	Part No.	Description		Remark
L101	1-408-413-00	INDUCTOR	22UH	
L201	1-408-413-00	INDUCTOR	22UH	
L301	1-408-413-00	INDUCTOR	22UH	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q1	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q2	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q10	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q11	8-729-200-17	TRANSISTOR 2SA1091-O	
Q12	8-729-255-12	TRANSISTOR 2SC2551-O	
Q20	8-729-119-80	TRANSISTOR 2SC2688-LK	
Q21	8-729-800-10	TRANSISTOR 2SC3068	
Q22	8-729-119-80	TRANSISTOR 2SC2688-LK	
Q23	8-729-306-92	TRANSISTOR 2SD669A-C	
	*4-363-146-00	HEAT SINK, V.OUT (;Q23H)	
	4-370-970-01	SPACER, TR (;Q23S)	
Q30	8-729-119-80	TRANSISTOR 2SC2688-LK	
Q101	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q102	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q103	8-729-384-48	TRANSISTOR 2SA844-E	
Q104	8-729-200-17	TRANSISTOR 2SA1091-O	
Q105	8-729-822-47	TRANSISTOR 2SC3955-E	
	*4-363-146-00	HEAT SINK, V.OUT (;Q105H)	
	4-370-970-01	SPACER, TR (;Q105S)	
Q106	8-729-802-71	TRANSISTOR 2SA1407-D	
Q107	8-729-802-71	TRANSISTOR 2SA1142-E	
Q201	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q202	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q203	8-729-384-48	TRANSISTOR 2SA844-E	
Q204	8-729-200-17	TRANSISTOR 2SA1091-O	
Q205	8-729-822-47	TRANSISTOR 2SC3955-E	
	*4-363-146-00	HEAT SINK, V.OUT (;Q205H)	
	4-370-970-01	SPACER, TR (;Q205S)	
Q206	8-729-802-71	TRANSISTOR 2SA1407-D	
Q207	8-729-802-71	TRANSISTOR 2SA1407-D	
Q301	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q302	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q303	8-729-384-48	TRANSISTOR 2SA844-E	
Q304	8-729-200-17	TRANSISTOR 2SA1091-O	
Q305	8-729-822-47	TRANSISTOR 2SC3955-E	
	*4-363-146-00	HEAT SINK, V.OUT (;Q305H)	
	4-370-970-01	SPACER, TR (;Q305S)	
Q306	8-729-802-71	TRANSISTOR 2SA1407-D	
Q307	8-729-802-71	TRANSISTOR 2SA1407-D	

RESISTOR

Ref.No	Part No.	Description				Remark
R1	1-249-431-11	CARBON	15K	5%	1/4W	
R2	1-249-435-11	CARBON	33K	5%	1/4W	
R3	1-249-422-11	CARBON	2.7K	5%	1/4W	
R4	1-249-419-11	CARBON	1.5K	5%	1/4W	
R5	1-249-431-11	CARBON	15K	5%	1/4W	
R6	1-249-425-11	CARBON	4.7K	5%	1/4W	
R10	1-249-417-11	CARBON	1K	5%	1/4W	
R11	1-249-431-11	CARBON	15K	5%	1/4W	
R12	1-249-437-11	CARBON	47K	5%	1/4W	
R13	1-249-423-11	CARBON	3.3K	5%	1/4W	
R14	1-249-431-11	CARBON	15K	5%	1/4W	
R16	1-215-901-00	METAL OXIDE	33K	5%	2W	F
R17	1-215-901-00	METAL OXIDE	33K	5%	2W	F
R20	1-216-461-00	METAL OXIDE	5.6K	5%	2W	F
R21	1-215-471-00	METAL	120K	1%	1/4W	
R22	1-215-470-00	METAL	110K	1%	1/4W	
R23	1-215-445-00	METAL	10K	1%	1/4W	
R24	1-215-439-00	METAL	5.6K	1%	1/4W	
R25	1-215-445-00	METAL	10K	1%	1/4W	
R26	1-215-445-00	METAL	10K	1%	1/4W	
R27	1-216-461-00	METAL OXIDE	5.6K	5%	2W	F
R31	1-247-874-11	CARBON	62K	5%	1/4W	
R32	1-249-440-11	CARBON	82K	5%	1/4W	
R33	1-249-430-11	CARBON	12K	5%	1/4W	
R34	1-249-429-11	CARBON	10K	5%	1/4W	
R35	1-249-417-11	CARBON	1K	5%	1/4W	
R37	1-249-415-11	CARBON	680	5%	1/4W	
R38	1-249-441-11	CARBON	100K	5%	1/4W	
R100	1-249-405-11	CARBON	100	5%	1/4W	
R101	1-215-409-00	METAL	330	1%	1/4W	
R102	1-249-419-11	CARBON	1.5K	5%	1/4W	
R103	1-215-435-00	METAL	3.9K	1%	1/4W	
R104	1-249-422-11	CARBON	2.7K	5%	1/4W	
R105	1-249-405-11	CARBON	100	5%	1/4W	
R106	1-215-412-00	METAL	430	1%	1/4W	
R107	1-215-467-00	METAL	82K	1%	1/4W	
R108	1-215-467-00	METAL	82K	1%	1/4W	
R109	1-216-457-00	METAL OXIDE	1.2K	5%	2W	F
R110	1-216-457-00	METAL OXIDE	1.2K	5%	2W	F
R111	1-216-457-00	METAL OXIDE	1.2K	5%	2W	F
R112	1-216-457-00	METAL OXIDE	1.2K	5%	2W	F
R113	1-249-405-11	CARBON	100	5%	1/4W	
R114	1-215-401-11	METAL	150	1%	1/4W	
R115	1-215-865-11	METAL OXIDE	220	5%	1W	F
R116	1-215-439-00	METAL	5.6K	1%	1/4W	
R117	1-215-481-00	METAL	330K	1%	1/4W	
R119	1-249-431-11	CARBON	15K	5%	1/4W	
R120	1-249-405-11	CARBON	100	5%	1/4W	
R124	1-249-423-11	CARBON	3.3K	5%	1/4W	
R125	1-247-834-11	CARBON	1.3K	5%	1/4W	
R126	1-249-429-11	CARBON	10K	5%	1/4W	
R127	1-249-417-11	CARBON	1K	5%	1/4W	
R130	1-249-405-11	CARBON	100	5%	1/4W	
R200	1-249-405-11	CARBON	100	5%	1/4W	
R201	1-215-409-00	METAL	330	1%	1/4W	
R202	1-249-419-11	CARBON	1.5K	5%	1/4W	
R203	1-215-435-00	METAL	3.9K	1%	1/4W	
R204	1-249-422-11	CARBON	2.7K	5%	1/4W	

Ref.No	Part No.	Description				Remark
R205	1-249-405-11	CARBON	100	5%	1/4W	
R206	1-215-412-00	METAL	430	1%	1/4W	
R207	1-215-467-00	METAL	82K	1%	1/4W	
R208	1-215-467-00	METAL	82K	1%	1/4W	
R209	1-216-457-00	METAL OXIDE	1.2K	5%	2W	F
R210	1-216-457-00	METAL OXIDE	1.2K	5%	2W	F
R211	1-216-457-00	METAL OXIDE	1.2K	5%	2W	F
R212	1-216-457-00	METAL OXIDE	1.2K	5%	2W	F
R213	1-249-405-11	CARBON	100	5%	1/4W	
R214	1-215-401-11	METAL	150	1%	1/4W	
R215	1-215-865-11	METAL OXIDE	220	5%	1W	F
R216	1-215-439-00	METAL	5.6K	1%	1/4W	
R217	1-215-481-00	METAL	330K	1%	1/4W	
R219	1-249-431-11	CARBON	15K	5%	1/4W	
R220	1-249-405-11	CARBON	100	5%	1/4W	
R224	1-249-423-11	CARBON	3.3K	5%	1/4W	
R225	1-247-834-11	CARBON	1.3K	5%	1/4W	
R226	1-249-429-11	CARBON	10K	5%	1/4W	
R227	1-249-417-11	CARBON	1K	5%	1/4W	
R230	1-249-405-11	CARBON	100	5%	1/4W	
R300	1-249-405-11	CARBON	100	5%	1/4W	
R301	1-215-409-00	METAL	330	1%	1/4W	
R302	1-249-419-11	CARBON	1.5K	5%	1/4W	
R303	1-215-435-00	METAL	3.9K	1%	1/4W	
R304	1-249-422-11	CARBON	2.7K	5%	1/4W	
R305	1-249-405-11	CARBON	100	5%	1/4W	
R306	1-215-412-00	METAL	430	1%	1/4W	
R307	1-215-467-00	METAL	82K	1%	1/4W	
R308	1-215-467-00	METAL	82K	1%	1/4W	
R309	1-216-457-00	METAL OXIDE	1.2K	5%	2W	F
R310	1-216-457-00	METAL OXIDE	1.2K	5%	2W	F
R311	1-216-457-00	METAL OXIDE	1.2K	5%	2W	F
R312	1-216-457-00	METAL OXIDE	1.2K	5%	2W	F
R313	1-249-405-11	CARBON	100	5%	1/4W	
R314	1-215-401-11	METAL	150	1%	1/4W	
R315	1-215-865-11	METAL OXIDE	220	5%	1W	F
R316	1-215-439-00	METAL	5.6K	1%	1/4W	
R317	1-215-481-00	METAL	330K	1%	1/4W	
R319	1-249-431-11	CARBON	15K	5%	1/4W	
R320	1-249-405-11	CARBON	100	5%	1/4W	
R324	1-249-423-11	CARBON	3.3K	5%	1/4W	
R325	1-247-834-11	CARBON	1.3K	5%	1/4W	
R326	1-249-429-11	CARBON	10K	5%	1/4W	
R327	1-249-417-11	CARBON	1K	5%	1/4W	
R330	1-249-405-11	CARBON	100	5%	1/4W	

VARIABLE RESISTOR

RV101	1-237-515-21	RES, ADJ, CERMET 1K
RV201	1-237-515-21	RES, ADJ, CERMET 1K
RV301	1-237-515-21	RES, ADJ, CERMET 1K

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*A-1135-606-B BT BOARD, COMPLETE(BVM-1915 ONLY)
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*4-353-708-00 HOOK, FINGER
7-682-547-04 SCREW BVTT 3X6 (S)

CAPACITOR

C1	1-124-477-11	ELECT	47MF	20%	16V
C3	1-124-477-11	ELECT	47MF	20%	16V
C4	1-124-477-11	ELECT	47MF	20%	16V
C5	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C6	1-124-477-11	ELECT	47MF	20%	16V
C9	1-163-109-00	CERAMIC CHIP	47PF	5%	50V

Ref.No	Part No.	Description			Remark
C10	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C14	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C15	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C16	1-163-227-11	CERAMIC CHIP	10PF	5%	50V
C17	1-163-093-00	CERAMIC CHIP	10PF	5%	50V
C18	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C19	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C20	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C21	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C22	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C23	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C30	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C32	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C34	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C37	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C38	1-163-088-00	CERAMIC CHIP	5PF	0.25PF	50V
C40	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C42	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C43	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C44	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C45	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C47	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C48	1-124-907-11	ELECT	10MF	20%	50V
C49	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C50	1-124-907-11	ELECT	10MF	20%	50V
C51	1-123-875-11	ELECT	10MF	20%	50V
C52	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C53	1-123-875-11	ELECT	10MF	20%	50V
C54	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C55	1-123-875-11	ELECT	10MF	20%	50V
C56	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C60	1-124-478-11	ELECT	100MF	20%	25V
C61	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C62	1-124-907-11	ELECT	10MF	20%	50V
C63	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C64	1-124-477-11	ELECT	47MF	20%	16V
C65	1-124-907-11	ELECT	10MF	20%	50V
C66	1-124-907-11	ELECT	10MF	20%	50V
C67	1-124-907-11	ELECT	10MF	20%	50V
C68	1-124-907-11	ELECT	10MF	20%	50V
C69	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C70	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C71	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C72	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C73	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C74	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C75	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C76	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C77	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C78	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C79	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C80	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C81	1-123-875-11	ELECT	10MF	20%	50V
C82	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C83	1-123-875-11	ELECT	10MF	20%	50V
C84	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C85	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C86	1-123-875-11	ELECT	10MF	20%	50V
C87	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C88	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C89	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C90	1-124-907-11	ELECT	10MF	20%	50V
C100	1-124-478-11	ELECT	100MF	20%	25V
C101	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C102	1-124-907-11	ELECT	10MF	20%	50V

BT

Ref.No	Part No.	Description			Remark
C103	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C104	1-124-477-11	ELECT	47MF	20%	16V
C105	1-124-907-11	ELECT	10MF	20%	50V
C106	1-124-907-11	ELECT	10MF	20%	50V
C107	1-124-907-11	ELECT	10MF	20%	50V
C108	1-124-907-11	ELECT	10MF	20%	50V
C109	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C110	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C111	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C112	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C113	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C114	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C115	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C116	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C117	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C118	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C119	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C331	1-135-091-00	TANTAL CHIP	1MF	20%	16V
C332	1-135-092-21	TANTAL CHIP	3.3MF	20%	16V
C333	1-135-092-21	TANTAL CHIP	3.3MF	20%	16V
C334	1-135-092-21	TANTAL CHIP	3.3MF	20%	16V
C335	1-135-092-21	TANTAL CHIP	3.3MF	20%	16V
C336	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C337	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C338	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C339	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C341	1-135-091-00	TANTAL CHIP	1MF	20%	16V
C342	1-135-092-21	TANTAL CHIP	3.3MF	20%	16V
C343	1-135-092-21	TANTAL CHIP	3.3MF	20%	16V
C344	1-135-092-21	TANTAL CHIP	3.3MF	20%	16V
C345	1-135-092-21	TANTAL CHIP	3.3MF	20%	16V
C346	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C347	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C348	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C349	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C361	1-135-091-00	TANTAL CHIP	1MF	20%	16V
C362	1-135-092-21	TANTAL CHIP	3.3MF	20%	16V
C363	1-135-092-21	TANTAL CHIP	3.3MF	20%	16V
C364	1-135-092-21	TANTAL CHIP	3.3MF	20%	16V
C365	1-135-092-21	TANTAL CHIP	3.3MF	20%	16V
C366	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C367	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C368	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C369	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C501	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C502	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C503	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C504	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C505	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C506	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C507	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C508	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C509	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C510	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C511	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C512	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C513	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C514	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C515	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C516	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C517	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C518	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C519	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C520	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C521	1-163-038-00	CERAMIC CHIP	0.1MF		25V

Ref.No	Part No.	Description			Remark
C522	1-163-038-00	CERAMIC CHIP	0.1MF		25V

VARIABLE CAPACITOR

CV1	1-141-304-21	TRIMMER, CERAMIC
CV2	1-141-304-21	TRIMMER, CERAMIC
CV3	1-141-304-21	TRIMMER, CERAMIC
CV4	1-141-304-21	TRIMMER, CERAMIC
CV5	1-141-304-21	TRIMMER, CERAMIC
CV6	1-141-304-21	TRIMMER, CERAMIC

DIODE

D1	8-719-104-34	DIODE 1S2836
D2	8-719-105-91	DIODE RD5.6M-B2
D3	8-719-400-18	DIODE MA152WK
D4	8-719-400-18	DIODE MA152WK
D5	8-719-400-18	DIODE MA152WK
D6	8-719-104-34	DIODE 1S2836
D7	8-719-400-18	DIODE MA152WK
D8	8-719-104-34	DIODE 1S2836
D9	8-719-104-34	DIODE 1S2836
D331	8-719-400-18	DIODE MA152WK
D341	8-719-400-18	DIODE MA152WK
D361	8-719-400-18	DIODE MA152WK

DELAY LINE

DL1	1-415-348-21	DELAY LINE
DL2	1-415-477-11	DELAY LINE
DL3	1-415-700-11	DELAY LINE
DL4	1-415-654-12	DELAY LINE
DL5	1-415-700-11	DELAY LINE
DL6	1-415-700-11	DELAY LINE
DL7	1-415-348-21	DELAY LINE
DL8	1-415-700-11	DELAY LINE
DL9	1-415-727-11	DELAY LINE

FILTER

FL1	1-236-562-11	FILTER, LOW PASS
FL2	1-236-561-11	FILTER, LOW PASS
FL3	1-236-732-11	FILTER, LOW PASS

IC

IC1	8-759-800-81	IC LA7016
IC2	8-759-800-81	IC LA7016
IC3	8-759-982-10	IC RC7809FA
IC4	8-759-982-05	IC RC7805FA
IC331	8-752-334-78	IC CXL1009P-1
	1-526-656-00	SOCKET, IC (DP) 20P (;IC331)
IC341	8-752-334-78	IC CXL1009P-1
	1-526-656-00	SOCKET, IC (DP) 20P (;IC341)
IC361	8-752-330-14	IC CXL1009P
	1-526-656-00	SOCKET, IC (DP) 20P (;IC361)
IC501	8-752-053-68	IC CXA1539P
	*1-526-659-00	SOCKET, IC (DP) 28P (;IC501)

COIL

L1	1-410-196-11	INDUCTOR CHIP	2.2UH		
L2	1-410-200-31	INDUCTOR CHIP	4.7UH		
L3	1-410-192-51	INDUCTOR CHIP	1UH		
L4	1-216-296-00	METAL GLAZE	0	5%	1/8W
L5	1-216-296-00	METAL GLAZE	0	5%	1/8W
L6	1-410-196-11	INDUCTOR CHIP	2.2UH		
L7	1-410-470-11	INDUCTOR	10UH		
L8	1-410-470-11	INDUCTOR	10UH		
L9	1-410-204-31	INDUCTOR CHIP	10UH		
L10	1-408-419-00	INDUCTOR	68UH		

Ref.No	Part No.	Description	Remark
L11	1-410-200-31	INDUCTOR CHIP 4.7UH	
L12	1-410-200-31	INDUCTOR CHIP 4.7UH	
L13	1-410-196-11	INDUCTOR CHIP 2.2UH	
L14	1-410-204-31	INDUCTOR CHIP 10UH	
L15	1-410-216-31	INDUCTOR CHIP 100UH	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q1	8-729-216-22	TRANSISTOR 2SA1162-G	
Q2	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q3	8-729-122-63	TRANSISTOR 2SA1226-E4	
Q4	8-729-175-72	TRANSISTOR 2SC2757-T33	
Q5	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q6	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q7	8-729-122-63	TRANSISTOR 2SA1226-E4	
Q8	8-729-216-22	TRANSISTOR 2SA1162-G	
Q9	8-729-122-63	TRANSISTOR 2SA1226-E4	
Q10	8-729-175-72	TRANSISTOR 2SC2757-T33	
Q11	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q12	8-729-122-63	TRANSISTOR 2SA1226-E4	
Q13	8-729-175-72	TRANSISTOR 2SC2757-T33	
Q14	8-729-175-72	TRANSISTOR 2SC2757-T33	
Q15	8-729-216-22	TRANSISTOR 2SA1162-G	
Q16	8-729-107-46	TRANSISTOR 2SC3624A-L15	
Q17	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q18	8-729-216-22	TRANSISTOR 2SA1162-G	
Q19	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q20	8-729-175-72	TRANSISTOR 2SC2757-T33	
Q21	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q22	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q23	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q24	8-729-216-22	TRANSISTOR 2SA1162-G	
Q25	8-729-107-46	TRANSISTOR 2SC3624A-L15	
Q32	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q33	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q34	8-729-216-22	TRANSISTOR 2SA1162-G	
Q35	8-729-216-22	TRANSISTOR 2SA1162-G	
Q36	8-729-122-63	TRANSISTOR 2SA1226-E4	
Q37	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q38	8-729-122-63	TRANSISTOR 2SA1226-E4	
Q39	8-729-175-72	TRANSISTOR 2SC2757-T33	
Q40	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q41	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q42	8-729-216-22	TRANSISTOR 2SA1162-G	
Q43	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q44	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q45	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q52	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q54	8-729-216-22	TRANSISTOR 2SA1162-G	
Q56	8-729-122-63	TRANSISTOR 2SA1226-E4	
Q57	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q58	8-729-122-63	TRANSISTOR 2SA1226-E4	
Q59	8-729-175-72	TRANSISTOR 2SC2757-T33	
Q60	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q61	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q62	8-729-216-22	TRANSISTOR 2SA1162-G	
Q65	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q71	8-729-175-72	TRANSISTOR 2SC2757-T33	
Q72	8-729-122-63	TRANSISTOR 2SA1226-E4	
Q73	8-729-175-72	TRANSISTOR 2SC2757-T33	
Q74	8-729-122-63	TRANSISTOR 2SA1226-E4	
Q81	8-729-901-06	TRANSISTOR DTA144EK	
Q82	8-729-901-01	TRANSISTOR DTC144EK	
Q83	8-729-901-06	TRANSISTOR DTA144EK	
Q84	8-729-901-06	TRANSISTOR DTA144EK	
Q85	8-729-140-97	TRANSISTOR 2SB734-34	
Q86	8-729-140-96	TRANSISTOR 2SD774-34	

RESISTOR

Ref.No	Part No.	Description			Remark
JW1	1-216-295-00	METAL GLAZE	0	5%	1/10W
JW2	1-216-295-00	METAL GLAZE	0	5%	1/10W
JW3	1-216-295-00	METAL GLAZE	0	5%	1/10W
JW5	1-216-295-00	METAL GLAZE	0	5%	1/10W
JW11	1-216-295-00	METAL GLAZE	0	5%	1/10W
JW12	1-216-295-00	METAL GLAZE	0	5%	1/10W
JW13	1-216-295-00	METAL GLAZE	0	5%	1/10W
JW14	1-216-295-00	METAL GLAZE	0	5%	1/10W
JW15	1-216-295-00	METAL GLAZE	0	5%	1/10W
R1	1-216-025-00	METAL GLAZE	100	5%	1/10W
R2	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R3	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R4	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R5	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R6	1-216-025-00	METAL GLAZE	100	5%	1/10W
R7	1-216-075-00	METAL GLAZE	12K	5%	1/10W
R8	1-216-643-11	METAL CHIP	470	0.50%	1/10W
R9	1-216-661-11	METAL CHIP	2.7K	0.50%	1/10W
R10	1-216-643-11	METAL CHIP	470	0.50%	1/10W
R11	1-216-661-11	METAL CHIP	2.7K	0.50%	1/10W
R12	1-216-675-11	METAL CHIP	10K	0.50%	1/10W
R13	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R14	1-216-663-11	METAL CHIP	3.3K	0.50%	1/10W
R15	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R16	1-216-025-00	METAL GLAZE	100	5%	1/10W
R17	1-216-075-00	METAL GLAZE	12K	5%	1/10W
R18	1-216-025-00	METAL GLAZE	100	5%	1/10W
R19	1-216-025-00	METAL GLAZE	100	5%	1/10W
R20	1-216-025-00	METAL GLAZE	100	5%	1/10W
R21	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R22	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R23	1-216-635-11	METAL CHIP	220	0.50%	1/10W
R24	1-216-635-11	METAL CHIP	220	0.50%	1/10W
R25	1-216-075-00	METAL GLAZE	12K	5%	1/10W
R26	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W
R27	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R28	1-216-025-00	METAL GLAZE	100	5%	1/10W
R29	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R30	1-216-651-11	METAL CHIP	1K	0.50%	1/10W
R31	1-216-025-00	METAL GLAZE	100	5%	1/10W
R33	1-216-665-11	METAL CHIP	3.9K	0.50%	1/10W
R34	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R35	1-216-651-11	METAL CHIP	1K	0.50%	1/10W
R36	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R37	1-216-025-00	METAL GLAZE	100	5%	1/10W
R38	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W
R39	1-216-635-11	METAL CHIP	220	0.50%	1/10W
R40	1-216-630-11	METAL CHIP	130	0.50%	1/10W
R41	1-216-630-11	METAL CHIP	130	0.50%	1/10W
R42	1-216-635-11	METAL CHIP	220	0.50%	1/10W
R43	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W
R44	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R45	1-216-651-11	METAL CHIP	1K	0.50%	1/10W
R46	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R47	1-216-025-00	METAL GLAZE	100	5%	1/10W
R48	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R49	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R50	1-216-025-00	METAL GLAZE	100	5%	1/10W
R51	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R52	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R53	1-216-075-00	METAL GLAZE	12K	5%	1/10W
R54	1-216-025-00	METAL GLAZE	100	5%	1/10W
R55	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W
R56	1-216-025-00	METAL GLAZE	100	5%	1/10W

Ref.No	Part No.	Description				Remark
R57	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R58	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R59	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R60	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R61	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R62	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R63	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R64	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R65	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R66	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R67	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R68	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R69	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R70	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R71	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R72	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R73	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R74	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R75	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R76	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R77	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R78	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R79	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R80	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R81	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R82	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R83	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R84	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R85	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R86	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R87	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R88	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R89	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R103	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R104	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R105	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R106	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R107	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R108	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R109	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R110	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R111	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R112	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R113	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R114	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R115	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R116	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R117	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R118	1-216-663-11	METAL CHIP	3.3K	0.50%	1/10W	
R119	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R120	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R121	1-216-657-11	METAL CHIP	1.8K	0.50%	1/10W	
R122	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R123	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R124	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R125	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R126	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R127	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R128	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R129	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R130	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R131	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R132	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R133	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R134	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R135	1-216-635-11	METAL CHIP	220	0.50%	1/10W	
R136	1-216-635-11	METAL CHIP	220	0.50%	1/10W	
R137	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R138	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R139	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R140	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R141	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R142	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R143	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R150	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R153	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R154	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R157	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R158	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R161	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R163	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R164	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R165	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R166	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R167	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R169	1-216-655-11	METAL CHIP	1.5K	0.50%	1/10W	
R170	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R171	1-216-657-11	METAL CHIP	1.8K	0.50%	1/10W	
R172	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R173	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R174	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R175	1-216-655-11	METAL CHIP	1.5K	0.50%	1/10W	
R176	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R177	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R178	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R179	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R181	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R182	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R183	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R184	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R185	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R186	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R191	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R192	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R193	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R201	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R202	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R203	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R204	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R205	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R206	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R207	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R208	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R209	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R210	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R211	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R212	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R213	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R214	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R215	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R216	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R217	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R218	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R219	1-215-881-11	METAL OXIDE	15	5%	2W	F
R331	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R332	1-216-288-11	METAL GLAZE	5.6M	5%	1/8W	
R341	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R342	1-216-288-11	METAL GLAZE	5.6M	5%	1/8W	
R361	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R362	1-216-288-11	METAL GLAZE	5.6M	5%	1/8W	

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

Ref.No	Part No.	Description			Remark
R501	1-216-121-00	METAL GLAZE	1M	5%	1/10W
R502	1-216-049-00	METAL GLAZE	1K	5%	1/10W

VARIABLE RESISTOR

Ref.No	Part No.	Description
RV1	1-237-515-21	RES, ADJ, CERMET 1K
RV2	1-237-517-21	RES, ADJ, CERMET 5K
RV3	1-237-515-21	RES, ADJ, CERMET 1K
RV4	1-237-515-21	RES, ADJ, CERMET 1K
RV5	1-237-515-21	RES, ADJ, CERMET 1K
RV6	1-237-517-21	RES, ADJ, CERMET 5K
RV7	1-237-515-21	RES, ADJ, CERMET 1K
RV8	1-237-515-21	RES, ADJ, CERMET 1K
RV9	1-237-516-21	RES, ADJ, CERMET 2K
RV10	1-237-515-21	RES, ADJ, CERMET 1K
RV11	1-237-516-21	RES, ADJ, CERMET 2K
RV12	1-237-515-21	RES, ADJ, CERMET 1K

CRYSTAL

Ref.No	Part No.	Description
X1	1-567-790-11	VIBRATOR, CRYSTAL

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*A-1331-020-A C BOARD, COMPLETE
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Ref.No	Part No.	Description
	⚠1-526-798-35	SOCKET, PICTURE TUBE
	*4-341-751-01	EYELET (EY3, EY4)
	*4-341-752-01	EYELET (EY1, EY2)
	4-379-160-01	COVER (REAR LID), CV
	4-379-167-01	COVER (MAIN), CV

CONNECTOR

Ref.No	Part No.	Description
C1	*1-566-054-11	PIN, CONNECTOR 2P
C2	*1-566-056-11	PIN, CONNECTOR 4P
C3	*1-566-056-11	PIN, CONNECTOR 4P
C4	*1-566-056-11	PIN, CONNECTOR 4P
C5	*1-566-055-11	PIN, CONNECTOR 3P
C6	*1-566-054-11	PIN, CONNECTOR 2P
C7	*1-508-766-00	PIN, CONNECTOR (5MM PITCH) 4P
C8	*1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P

CAPACITOR

Ref.No	Part No.	Description			Remark
C1	1-162-114-00	CERAMIC	0.0047MF		2KV
C2	1-129-724-00	FILM	0.068MF	10%	630V
C3	1-124-910-11	ELECT	47MF	20%	25V
C4	1-162-114-00	CERAMIC	0.0047MF		2KV
C6	1-124-910-11	ELECT	47MF	20%	25V
C7	1-162-114-00	CERAMIC	0.0047MF		2KV

DIODE

Ref.No	Part No.	Description
D1	8-719-911-19	DIODE 1SS119
D3	8-719-911-19	DIODE 1SS119
D4	8-719-911-19	DIODE 1SS119

COIL

Ref.No	Part No.	Description	
L1	1-408-414-00	INDUCTOR	27UH
L2	1-408-414-00	INDUCTOR	27UH
L3	1-408-414-00	INDUCTOR	27UH

TRANSISTOR

Ref.No	Part No.	Description
Q1	8-729-804-48	TRANSISTOR 2SC3675
Q2	8-729-804-48	TRANSISTOR 2SC3675
Q3	8-729-255-12	TRANSISTOR 2SC2551-O
Q4	8-729-119-78	TRANSISTOR 2SC2785-HFE

RESISTOR

Ref.No	Part No.	Description			Remark
R1	1-202-818-00	SOLID	1K	10%	1/2W
R2	1-202-818-00	SOLID	1K	10%	1/2W
R3	1-202-818-00	SOLID	1K	10%	1/2W
R4	1-249-433-11	CARBON	22K	5%	1/4W
R5	1-202-818-00	SOLID	1K	10%	1/2W
R6	1-202-818-00	SOLID	1K	10%	1/2W
R7	1-249-433-11	CARBON	22K	5%	1/4W
R8	1-202-818-00	SOLID	1K	10%	1/2W
R9	1-202-818-00	SOLID	1K	10%	1/2W
R10	1-249-433-11	CARBON	22K	5%	1/4W
R11	1-202-719-00	SOLID	1M	10%	1/2W
R13	1-202-735-00	SOLID	22M	10%	1/2W
R14	1-202-818-00	SOLID	1K	10%	1/2W
R15	1-202-721-00	SOLID	1.5M	10%	1/2W
R16	1-202-848-00	SOLID	680K	10%	1/2W
R17	1-249-438-11	CARBON	56K	5%	1/4W
R18	1-202-719-00	SOLID	1M	10%	1/2W
R20	1-249-430-11	CARBON	12K	5%	1/4W
R21	1-249-429-11	CARBON	10K	5%	1/4W
R22	1-249-427-11	CARBON	6.8K	5%	1/4W
R27	1-249-417-11	CARBON	1K	5%	1/4W
R28	1-202-818-00	SOLID	1K	10%	1/2W
R30	1-202-818-00	SOLID	1K	10%	1/2W
R31	1-202-818-00	SOLID	1K	10%	1/2W

VARIABLE RESISTOR

Ref.No	Part No.	Description
RV1	1-230-798-11	RES, ADJ, METAL GLAZE 90M

SPARK GAP

Ref.No	Part No.	Description
SG1	1-519-422-11	GAP, SPARK
SG3	1-519-422-11	GAP, SPARK
SG4	1-519-422-11	GAP, SPARK
SG5	1-519-422-11	GAP, SPARK
SG6	1-519-422-11	GAP, SPARK

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*A-1345-882-A DA BOARD, COMPLETE
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CAPACITOR

Ref.No	Part No.	Description			Remark
C1	1-136-153-00	FILM	0.01MF	5%	50V
C2	1-136-165-00	FILM	0.1MF	5%	50V
C3	1-126-163-11	ELECT	4.7MF	20%	16V
C4	1-126-160-11	ELECT	1MF	20%	50V
C5	1-126-160-11	ELECT	1MF	20%	50V
C6	1-126-160-11	ELECT	1MF	20%	50V
C7	1-126-160-11	ELECT	1MF	20%	50V
C8	1-101-004-00	CERAMIC	0.01MF		50V
C9	1-101-004-00	CERAMIC	0.01MF		50V
C10	1-101-004-00	CERAMIC	0.01MF		50V
C11	1-102-973-00	CERAMIC	100PF	5%	50V
C12	1-136-153-00	FILM	0.01MF	5%	50V
C13	1-136-153-00	FILM	0.01MF	5%	50V
C14	1-101-004-00	CERAMIC	0.01MF		50V
C15	1-101-004-00	CERAMIC	0.01MF		50V
C16	1-126-160-11	ELECT	1MF	20%	50V
C17	1-102-820-00	CERAMIC	330PF	5%	50V
C18	1-136-153-00	FILM	0.01MF	5%	50V
C19	1-126-160-11	ELECT	1MF	20%	50V
C20	1-101-004-00	CERAMIC	0.01MF		50V
C21	1-101-004-00	CERAMIC	0.01MF		50V
C22	1-101-004-00	CERAMIC	0.01MF		50V
C23	1-101-004-00	CERAMIC	0.01MF		50V

DA

Ref.No	Part No.	Description			Remark
C24	1-102-978-00	CERAMIC	220PF	5%	50V
C25	1-101-004-00	CERAMIC	0.01MF		50V
C50	1-124-242-00	ELECT	33MF	20%	25V
C51	1-124-589-11	ELECT	47MF	20%	16V
C52	1-126-157-11	ELECT	10MF	20%	16V
C55	1-101-004-00	CERAMIC	0.01MF		50V
C56	1-101-004-00	CERAMIC	0.01MF		50V
C57	1-101-004-00	CERAMIC	0.01MF		50V
C60	1-124-242-00	ELECT	33MF	20%	25V
C61	1-124-589-11	ELECT	47MF	20%	16V
C62	1-126-157-11	ELECT	10MF	20%	16V
C63	1-126-157-11	ELECT	10MF	20%	16V
C65	1-101-004-00	CERAMIC	0.01MF		50V
C66	1-101-004-00	CERAMIC	0.01MF		50V
C70	1-124-242-00	ELECT	33MF	20%	25V
C71	1-126-157-11	ELECT	10MF	20%	16V
C72	1-126-157-11	ELECT	10MF	20%	16V
C73	1-124-589-11	ELECT	47MF	20%	16V
C75	1-101-004-00	CERAMIC	0.01MF		50V
C76	1-101-004-00	CERAMIC	0.01MF		50V
C80	1-124-242-00	ELECT	33MF	20%	25V
C81	1-126-157-11	ELECT	10MF	20%	16V
C82	1-126-157-11	ELECT	10MF	20%	16V
C83	1-126-157-11	ELECT	10MF	20%	16V
C85	1-101-004-00	CERAMIC	0.01MF		50V
C86	1-101-004-00	CERAMIC	0.01MF		50V

CONNECTOR

Ref.No	Part No.	Description
DA1	*1-566-060-11	PIN, CONNECTOR 8P
DA2	*1-566-056-11	PIN, CONNECTOR 4P
DA3	*1-566-058-11	PIN, CONNECTOR 6P
DA4	*1-566-057-11	PIN, CONNECTOR 5P
DA5	*1-566-062-11	PIN, CONNECTOR 10P
DA6	*1-566-055-11	PIN, CONNECTOR 3P

DIODE

Ref.No	Part No.	Description
D1	8-719-911-19	DIODE 1SS119
D2	8-719-911-19	DIODE 1SS119
D3	8-719-110-03	DIODE RD7.5ES-B2
D4	8-719-109-84	DIODE RD5.1ES-B2

IC

Ref.No	Part No.	Description
IC1	8-759-909-70	IC CX23025
IC2	8-752-033-68	IC CXA1268P
IC3	8-759-140-53	IC MC14053BCP
IC4	8-759-981-95	IC RC4558S
IC5	8-759-140-53	IC MC14053BCP
IC6	8-759-981-95	IC RC4558S
IC7	8-759-981-95	IC RC4558S
IC8	8-759-000-49	IC MC14066BCP
IC9	8-759-140-53	IC MC14053BCP
IC10	8-759-981-95	IC RC4558S
IC11	8-759-990-82	IC TL082CP
IC12	8-759-990-82	IC TL082CP
IC13	8-759-990-82	IC TL082CP
IC14	8-759-945-58	IC RC4558P
IC15	8-759-990-82	IC TL082CP
IC16	8-759-945-58	IC RC4558P
IC17	8-759-981-64	IC LM2903DQ
IC18	8-759-981-64	IC LM2903DQ
IC20	8-759-929-62	IC LM7812C7
IC21	8-759-929-65	IC LM7912C7
IC22	8-759-982-31	IC RC78M05FA
IC23	8-759-982-52	IC RC79M05FA

TRANSISTOR

Ref.No	Part No.	Description
Q1	8-729-900-89	TRANSISTOR DTC144ES
Q2	8-729-255-12	TRANSISTOR 2SC2551-O
Q3	8-729-119-78	TRANSISTOR 2SC2785-HFE

RESISTOR

Ref.No	Part No.	Description			Remark
R1	1-249-441-11	CARBON	100K	5%	1/4W
R2	1-249-423-11	CARBON	3.3K	5%	1/4W
R3	1-249-423-11	CARBON	3.3K	5%	1/4W
R4	1-249-429-11	CARBON	10K	5%	1/4W
R5	1-249-429-11	CARBON	10K	5%	1/4W
R6	1-249-431-11	CARBON	15K	5%	1/4W
R7	1-249-429-11	CARBON	10K	5%	1/4W
R8	1-249-431-11	CARBON	15K	5%	1/4W
R9	1-249-431-11	CARBON	15K	5%	1/4W
R10	1-249-431-11	CARBON	15K	5%	1/4W
R11	1-249-431-11	CARBON	15K	5%	1/4W
R12	1-249-441-11	CARBON	100K	5%	1/4W
R13	1-249-405-11	CARBON	100	5%	1/4W
R14	1-249-429-11	CARBON	10K	5%	1/4W
R15	1-249-425-11	CARBON	4.7K	5%	1/4W
R16	1-249-429-11	CARBON	10K	5%	1/4W
R17	1-249-429-11	CARBON	10K	5%	1/4W
R18	1-249-441-11	CARBON	100K	5%	1/4W
R19	1-249-429-11	CARBON	10K	5%	1/4W
R20	1-249-429-11	CARBON	10K	5%	1/4W
R21	1-247-891-00	CARBON	330K	5%	1/4W
R22	1-247-903-00	CARBON	1M	5%	1/4W
R23	1-249-439-11	CARBON	68K	5%	1/4W
R24	1-249-435-11	CARBON	33K	5%	1/4W
R25	1-247-891-00	CARBON	330K	5%	1/4W
R26	1-249-439-11	CARBON	68K	5%	1/4W
R27	1-249-429-11	CARBON	10K	5%	1/4W
R28	1-249-429-11	CARBON	10K	5%	1/4W
R29	1-249-429-11	CARBON	10K	5%	1/4W
R30	1-249-429-11	CARBON	10K	5%	1/4W
R31	1-249-429-11	CARBON	10K	5%	1/4W
R32	1-249-429-11	CARBON	10K	5%	1/4W
R34	1-249-429-11	CARBON	10K	5%	1/4W
R35	1-249-429-11	CARBON	10K	5%	1/4W
R36	1-249-420-11	CARBON	1.8K	5%	1/4W
R37	1-249-433-11	CARBON	22K	5%	1/4W
R38	1-249-435-11	CARBON	33K	5%	1/4W
R39	1-249-437-11	CARBON	47K	5%	1/4W
R40	1-249-433-11	CARBON	22K	5%	1/4W
R41	1-249-437-11	CARBON	47K	5%	1/4W
R42	1-249-429-11	CARBON	10K	5%	1/4W
R43	1-249-440-11	CARBON	82K	5%	1/4W
R44	1-249-441-11	CARBON	100K	5%	1/4W
R45	1-249-441-11	CARBON	100K	5%	1/4W
R46	1-247-887-00	CARBON	220K	5%	1/4W
R47	1-249-439-11	CARBON	68K	5%	1/4W
R48	1-249-439-11	CARBON	68K	5%	1/4W
R49	1-249-426-11	CARBON	5.6K	5%	1/4W
R50	1-249-429-11	CARBON	10K	5%	1/4W
R51	1-249-434-11	CARBON	27K	5%	1/4W
R52	1-249-433-11	CARBON	22K	5%	1/4W
R53	1-249-425-11	CARBON	4.7K	5%	1/4W
R54	1-249-425-11	CARBON	4.7K	5%	1/4W
R55	1-249-433-11	CARBON	22K	5%	1/4W
R56	1-249-429-11	CARBON	10K	5%	1/4W
R57	1-249-429-11	CARBON	10K	5%	1/4W
R59	1-247-895-00	CARBON	470K	5%	1/4W
R60	1-249-439-11	CARBON	68K	5%	1/4W
R61	1-249-429-11	CARBON	10K	5%	1/4W

Ref.No	Part No.	Description				Remark
R62	1-247-895-00	CARBON	470K	5%	1/4W	
R63	1-249-429-11	CARBON	10K	5%	1/4W	
R64	1-249-441-11	CARBON	100K	5%	1/4W	
R65	1-249-429-11	CARBON	10K	5%	1/4W	
R66	1-247-885-00	CARBON	180K	5%	1/4W	
R67	1-247-891-00	CARBON	330K	5%	1/4W	
R68	1-249-429-11	CARBON	10K	5%	1/4W	
R69	1-249-429-11	CARBON	10K	5%	1/4W	
R70	1-249-429-11	CARBON	10K	5%	1/4W	
R71	1-215-445-00	METAL	10K	1%	1/4W	
R72	1-249-429-11	CARBON	10K	5%	1/4W	
R73	1-249-429-11	CARBON	10K	5%	1/4W	
R74	1-249-429-11	CARBON	10K	5%	1/4W	
R75	1-249-439-11	CARBON	68K	5%	1/4W	
R76	1-249-430-11	CARBON	12K	5%	1/4W	
R77	1-249-429-11	CARBON	10K	5%	1/4W	
R78	1-249-439-11	CARBON	68K	5%	1/4W	
R79	1-249-429-11	CARBON	10K	5%	1/4W	
R80	1-249-430-11	CARBON	12K	5%	1/4W	
R81	1-249-423-11	CARBON	3.3K	5%	1/4W	
R82	1-249-417-11	CARBON	1K	5%	1/4W	
R83	1-249-429-11	CARBON	10K	5%	1/4W	
R84	1-249-426-11	CARBON	5.6K	5%	1/4W	
R85	1-249-428-11	CARBON	8.2K	5%	1/4W	
R86	1-249-423-11	CARBON	3.3K	5%	1/4W	
R87	1-249-417-11	CARBON	1K	5%	1/4W	
R88	1-249-429-11	CARBON	10K	5%	1/4W	
R89	1-249-429-11	CARBON	10K	5%	1/4W	
R90	1-249-429-11	CARBON	10K	5%	1/4W	
R91	1-215-862-11	METAL OXIDE	68	5%	1W	F
R92	1-215-862-11	METAL OXIDE	68	5%	1W	F
R93	1-247-885-00	CARBON	180K	5%	1/4W	
R94	1-249-426-11	CARBON	5.6K	5%	1/4W	

VARIABLE RESISTOR

Ref.No	Part No.	Description
RV1	1-237-518-21	RES, ADJ, CERMET 10K
RV2	1-237-518-21	RES, ADJ, CERMET 10K
RV3	1-237-518-21	RES, ADJ, CERMET 10K
RV4	1-237-518-21	RES, ADJ, CERMET 10K
RV5	1-237-518-21	RES, ADJ, CERMET 10K
RV6	1-237-518-21	RES, ADJ, CERMET 10K
RV7	1-237-518-21	RES, ADJ, CERMET 10K
RV8	1-237-518-21	RES, ADJ, CERMET 10K
RV9	1-237-518-21	RES, ADJ, CERMET 10K
RV10	1-237-518-21	RES, ADJ, CERMET 10K
RV11	1-237-518-21	RES, ADJ, CERMET 10K
RV12	1-237-518-21	RES, ADJ, CERMET 10K
RV13	1-237-518-21	RES, ADJ, CERMET 10K
RV14	1-237-518-21	RES, ADJ, CERMET 10K
RV15	1-237-518-21	RES, ADJ, CERMET 10K
RV16	1-237-518-21	RES, ADJ, CERMET 10K
RV17	1-237-518-21	RES, ADJ, CERMET 10K
RV18	1-237-518-21	RES, ADJ, CERMET 10K
RV19	1-237-518-21	RES, ADJ, CERMET 10K
RV20	1-237-518-21	RES, ADJ, CERMET 10K
RV21	1-237-518-21	RES, ADJ, CERMET 10K
RV22	1-237-518-21	RES, ADJ, CERMET 10K
RV23	1-237-518-21	RES, ADJ, CERMET 10K
RV24	1-237-518-21	RES, ADJ, CERMET 10K
RV25	1-237-518-21	RES, ADJ, CERMET 10K

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Ref.No	Part No.	Description	Remark
	*A-1345-884-A	DB BOARD, COMPLETE	

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CAPACITOR

Ref.No	Part No.	Description				Remark
C201	1-101-004-00	CERAMIC	0.01MF		50V	
C202	1-136-153-00	FILM	0.01MF	5%	50V	
C203	1-136-165-00	FILM	0.1MF	5%	50V	
C204	1-126-157-11	ELECT	10MF	20%	16V	
C205	1-130-479-00	MYLAR	0.0047MF	5%	50V	
C206	1-124-234-00	ELECT	22MF	20%	16V	
C207	1-124-234-00	ELECT	22MF	20%	16V	
C208	1-130-475-00	MYLAR	0.0022MF	5%	50V	
C209	1-130-477-00	FILM	0.0033MF	5%	50V	
C210	1-102-518-11	CERAMIC	33PF	5%	50V	
C211	1-101-004-00	CERAMIC	0.01MF		50V	
C212	1-101-004-00	CERAMIC	0.01MF		50V	
C214	1-126-157-11	ELECT	10MF	20%	16V	
C215	1-126-157-11	ELECT	10MF	20%	16V	
C216	1-101-004-00	CERAMIC	0.01MF		50V	
C221	1-126-157-11	ELECT	10MF	20%	16V	
C223	1-101-004-00	CERAMIC	0.01MF		50V	
C224	1-101-004-00	CERAMIC	0.01MF		50V	
C231	1-126-157-11	ELECT	10MF	20%	16V	
C233	1-101-004-00	CERAMIC	0.01MF		50V	

DIODE

Ref.No	Part No.	Description
D201	8-719-911-19	DIODE 1SS119
D202	8-719-109-74	DIODE RD4.3ES-B1

CONNECTOR

Ref.No	Part No.	Description
DB1	*1-566-062-11	PIN, CONNECTOR 10P
DB2	*1-566-056-11	PIN, CONNECTOR 4P

IC

Ref.No	Part No.	Description
IC201	8-759-990-82	IC TL082CP
IC202	8-759-981-64	IC LM2903DQ
IC203	8-759-240-69	IC MC14069UBCP
IC204	8-759-100-60	IC UPC1377C

COIL

Ref.No	Part No.	Description	
L201	1-410-068-11	INDUCTOR	5.6MMH

TRANSISTOR

Ref.No	Part No.	Description
Q201	8-729-926-32	TRANSISTOR DTA144ES
Q202	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q203	8-729-926-32	TRANSISTOR DTA144ES

RESISTOR

Ref.No	Part No.	Description			
R201	1-249-417-11	CARBON	1K	5%	1/4W
R202	1-249-417-11	CARBON	1K	5%	1/4W
R203	1-215-440-00	METAL	6.2K	1%	1/4W
R204	1-249-429-11	CARBON	10K	5%	1/4W
R205	1-249-430-11	CARBON	12K	5%	1/4W
R206	1-249-439-11	CARBON	68K	5%	1/4W
R207	1-249-429-11	CARBON	10K	5%	1/4W
R208	1-249-429-11	CARBON	10K	5%	1/4W
R209	1-249-429-11	CARBON	10K	5%	1/4W
R210	1-249-419-11	CARBON	1.5K	5%	1/4W
R211	1-249-425-11	CARBON	4.7K	5%	1/4W
R212	1-249-417-11	CARBON	1K	5%	1/4W
R213	1-249-425-11	CARBON	4.7K	5%	1/4W
R214	1-249-417-11	CARBON	1K	5%	1/4W
R215	1-249-429-11	CARBON	10K	5%	1/4W
R216	1-249-415-11	CARBON	680	5%	1/4W

DB **EA**

Ref.No	Part No.	Description			Remark
R217	1-249-423-11	CARBON	3.3K	5%	1/4W
R218	1-249-425-11	CARBON	4.7K	5%	1/4W
R219	1-249-439-11	CARBON	68K	5%	1/4W
R220	1-249-417-11	CARBON	1K	5%	1/4W
R221	1-249-429-11	CARBON	10K	5%	1/4W
R222	1-249-429-11	CARBON	10K	5%	1/4W
R223	1-249-417-11	CARBON	1K	5%	1/4W
R224	1-249-430-11	CARBON	12K	5%	1/4W
R225	1-249-417-11	CARBON	1K	5%	1/4W
R226	1-249-417-11	CARBON	1K	5%	1/4W
R227	1-249-417-11	CARBON	1K	5%	1/4W
R228	1-249-417-11	CARBON	1K	5%	1/4W
R229	1-249-417-11	CARBON	1K	5%	1/4W

VARIABLE RESISTOR

Ref.No	Part No.	Description
RV201	1-237-518-21	RES, ADJ, CERMET 10K
RV202	1-237-517-21	RES, ADJ, CERMET 5K

SWITCH

Ref.No	Part No.	Description
S201	1-571-908-11	SWITCH, SLIDE

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*A-1345-881-B EA BOARD, COMPLETE

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Ref.No	Part No.	Description
	4-309-378-00	SPACER
	*4-341-751-01	EYELET (EY1~EY26)
	4-363-404-00	HOLDER, IC
	4-381-904-01	SPRING (C)
	4-381-907-01	INSULATOR (A)
	4-381-908-01	INSULATOR (B)
	*7-682-547-04	SCREW BVTT 3X6 (S)

CAPACITOR

Ref.No	Part No.	Description			Remark
C1	1-102-963-00	CERAMIC	33PF	5%	50V
C2	1-124-482-11	ELECT	33MF	20%	25V
C3	1-124-046-00	ELECT	10MF	20%	160V
C4	1-101-361-00	CERAMIC	150PF	5%	50V
C5	1-124-482-11	ELECT	33MF	20%	25V
C6	1-124-046-00	ELECT	10MF	20%	160V
C7	1-136-121-00	FILM	0.27MF	5%	400V
C8	1-136-108-00	FILM	0.43MF	5%	200V
C9	1-130-789-00	FILM	1MF	5%	100V
C10	1-124-046-00	ELECT	10MF		160V
C11	1-108-700-11	MYLAR	0.047MF	10%	200V
C12	1-108-692-11	MYLAR	0.01MF	10%	200V
C13	1-136-165-00	FILM	0.1MF	5%	50V
C14	1-102-074-00	CERAMIC	0.001MF	10%	50V
C15	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C16	1-102-973-00	CERAMIC	100PF	5%	50V
C17	1-124-477-11	ELECT	47MF	20%	25V
C18	1-124-034-51	ELECT	33MF	20%	16V
C19	1-124-907-11	ELECT	10MF	20%	50V
C20	1-124-903-11	ELECT	1MF	20%	50V
C21	1-123-356-00	ELECT	10MF	20%	16V
C23	1-136-161-00	FILM	0.047MF	5%	50V
C24	1-108-700-11	MYLAR	0.047MF	10%	200V
C25	1-162-117-00	CERAMIC	100PF	10%	500V
C26	1-123-024-21	ELECT	33MF		160V
C27	1-123-949-00	ELECT	33MF	20%	200V
C28	1-136-069-00	FILM	0.0044MF	3%	2KV
C29	1-136-066-00	FILM	0.003MF	3%	2KV
C30	1-124-512-11	ELECT	33MF	20%	50V
C31	1-124-512-11	ELECT	33MF	20%	50V
C35	1-162-114-00	CERAMIC	0.0047MF		2KV
C36	1-108-692-11	MYLAR	0.01MF	10%	200V
C37	1-102-978-00	CERAMIC	220PF	5%	50V
C50	1-136-165-00	FILM	0.1MF	5%	50V
C51	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C52	1-102-973-00	CERAMIC	100PF	5%	50V
C54	1-124-907-11	ELECT	10MF	20%	50V
C55	1-124-477-11	ELECT	47MF	20%	25V
C56	1-124-903-11	ELECT	1MF	20%	50V
C57	1-123-356-00	ELECT	10MF	20%	16V
C58	1-136-161-00	FILM	0.047MF	5%	50V
C59	1-108-700-11	MYLAR	0.047MF	10%	200V
C60	1-162-117-00	CERAMIC	100PF	10%	500V
C61	1-123-024-21	ELECT	33MF		160V
C62	1-136-169-00	FILM	0.22MF	5%	50V
C63	1-108-700-11	MYLAR	0.047MF	10%	200V
C64	1-162-117-00	CERAMIC	100PF	10%	500V
C65	1-136-072-00	FILM	0.0063MF	3%	2KV
C66	1-136-069-00	FILM	0.0044MF	3%	2KV
C67	1-162-134-11	CERAMIC	470PF	10%	2KV
C68	1-136-111-00	FILM	1MF	5%	200V
C69	1-102-978-00	CERAMIC	220PF	5%	50V
C70	1-124-807-	ELECT	4.7MF	20%	200V
C87	1-108-692-11	MYLAR	0.01MF	10%	200V
C89	1-162-117-00	CERAMIC	100PF	10%	500V
C90	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C99	1-162-130-11	CERAMIC	180PF	10%	2KV
C100	1-108-692-11	MYLAR	0.01MF	10%	200V
C101	1-102-963-00	CERAMIC	33PF	5%	50V
C110	1-126-101-11	ELECT	100MF	20%	16V
C201	1-124-478-11	ELECT	100MF	20%	25V
C202	1-124-340-00	ELECT	22MF	20%	200V
C203	1-124-478-11	ELECT	100MF	20%	25V
C204	1-102-978-00	CERAMIC	220PF	5%	50V
C207	1-124-340-00	ELECT	22MF	20%	200V
C208	1-163-157-00	FILM	0.022MF	5%	50V
C209	1-108-646-00	MYLAR	0.47MF	10%	100V
C300	1-124-807-	ELECT	4.7MF	20%	200V

DIODE

Ref.No	Part No.	Description
D1	8-719-110-31	DIODE RD12ESB2
D3	8-719-911-19	DIODE 1SS119
D4	8-719-911-19	DIODE 1SS119
D5	8-719-300-76	DIODE RH-1A
D6	8-719-000-28	THYRISTOR CR02AM-8
D7	8-719-300-76	DIODE RH-1A
D8	8-719-928-08	DIODE ERD28-08S
D9	8-719-300-76	DIODE RH-1A
D10	8-719-300-76	DIODE RH-1A
D12	8-719-901-19	DIODE V11N
D13	8-719-300-76	DIODE RH-1A
D14	8-719-300-76	DIODE RH-1A
D15	8-719-300-76	DIODE RH-1A
D16	8-719-300-76	DIODE RH-1A
D28	8-719-911-19	DIODE 1SS119
D30	8-719-911-19	DIODE 1SS119
D32	8-719-300-76	DIODE RH-1A
D33	8-719-300-76	DIODE RH-1A
D35	8-719-911-19	DIODE 1SS119
D37	8-719-911-19	DIODE 1SS119
D38	8-719-911-19	DIODE 1SS119
D39	8-719-110-31	DIODE RD12ESB2
D40	8-719-911-19	DIODE 1SS119
D41	8-719-109-66	DIODE RD3.3ES-B2
D42	8-719-300-76	DIODE RH-1A

EA

Ref.No	Part No.	Description	Remark
D50	8-719-000-28	THYRISTOR CR02AM-8	
D201	8-719-911-55	DIODE GP08D	
D202	8-719-911-55	DIODE GP08D	
D203	8-719-911-19	DIODE 1SS119	
D204	8-719-911-19	DIODE 1SS119	
D205	8-719-911-19	DIODE 1SS119	
D206	8-719-911-19	DIODE 1SS119	
		CONNECTOR	
EA1	*1-566-058-11	PIN, CONNECTOR 6P	
EA2	*1-566-057-11	PIN, CONNECTOR 5P	
EA3	*1-566-056-11	PIN, CONNECTOR 4P	
EA4	*1-566-057-11	PIN, CONNECTOR 5P	
EA5	*1-566-055-11	PIN, CONNECTOR 3P	
EA6	*1-566-054-11	PIN, CONNECTOR 2P	
EA7	*1-566-055-11	PIN, CONNECTOR 3P	
EA8	*1-566-056-11	PIN, CONNECTOR 4P	
EA9	*1-566-055-11	PIN, CONNECTOR 3P	
EA10	*1-566-058-11	PIN, CONNECTOR 6P	
EA11	*1-565-480-11	CONNECTOR, BOARD TO BOARD 4P	
EA12	*1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P	
EA13	*1-508-765-00	PIN, CONNECTOR (5MM PITCH) 3P	
EA14	*1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P	
EA15	1-568-536-11	PLUG (MINIATURE DY) 6P	
		IC	
IC1	8-759-947-49	IC FA5301P	
IC2	8-759-947-49	IC FA5301P	
IC3	8-759-990-82	IC TL082CP	
IC5	8-759-145-58	IC UPC4558C	
		COIL	
L1	1-459-433-00	COIL (WITH CORE)	
L2	1-459-433-00	COIL (WITH CORE)	
L3	1-459-433-00	COIL (WITH CORE)	
L4	1-459-111-00	COIL, DRAM CORE (CDI)	
L5	1-459-111-00	COIL, DRAM CORE (CDI)	
L6	1-459-087-00	COIL,HCC DUST CORE 3.9MMH	
L7	1-459-215-00	COIL (WITH CORE)	
L8	1-459-207-00	COIL, CORE	
L9	1-459-433-00	COIL (WITH CORE)	
L10	1-459-433-00	COIL (WITH CORE)	
L11	1-459-123-00	COIL,DUST CORE(PAC)	
		TRANSISTOR	
Q1	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q2	8-729-697-92	TRANSISTOR 2SA979-G	
Q3	8-729-140-96	TRANSISTOR 2SD774-33	
Q4	8-729-300-70	TRANSISTOR 2SD1137	
	7-682-548-04	SCREW P 3X8 (Q4)	
Q5	8-729-300-80	TRANSISTOR 2SB860	
	7-682-548-04	SCREW P 3X8 (Q5)	
Q6	8-729-119-80	TRANSISTOR 2SC2688-LK	
Q7	8-729-906-53	TRANSISTOR 2SC2542-15	
Q8	8-729-255-12	TRANSISTOR 2SC2551-O	
Q9	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q10	8-729-119-80	TRANSISTOR 2SC2688-LK	
Q11	8-729-800-80	TRANSISTOR 2SD1399-CA	
Q12	8-729-313-42	TRANSISTOR 2SD1134-C (Q12)	
Q13	8-729-385-82	TRANSISTOR 2SB858-C	
	7-682-548-04	SCREW P 3X8 (Q13)	
Q14	8-729-119-80	TRANSISTOR 2SC2688-LK	
Q15	8-729-200-17	TRANSISTOR 2SA1091-O	
Q16	8-729-906-53	2SC2542-15	
	7-682-548-04	SCREW P 3X8 (Q16)	
Q17	8-729-119-80	TRANSISTOR 2SC2688-LK	

Ref.No	Part No.	Description				Remark
Q18	8-729-800-80	TRANSISTOR 2SD1399-CA				
Q19	8-729-119-76	TRANSISTOR 2SA1175-HFE				
Q201	8-729-697-92	TRANSISTOR 2SA979-G				
Q202	8-729-140-96	TRANSISTOR 2SD774-34				
Q203	8-729-309-36	TRANSISTOR 2SA893A-D				
Q204	8-729-309-08	TRANSISTOR 2SC1890A-E				
Q205	8-729-300-80	TRANSISTOR 2SB860				
	7-682-548-04	SCREW P 3X8 (Q205)				
Q206	8-729-300-70	TRANSISTOR 2SD1137				
	7-682-548-04	SCREW P 3X8 (Q206)				
Q207	8-729-386-12	TRANSISTOR 2SB861-C				
Q208	8-729-255-12	TRANSISTOR 2SC2551-O				
		RESISTOR				
R1	1-249-425-11	CARBON	4.7K	5%	1/4W	
R2	1-249-422-11	CARBON	2.7K	5%	1/4W	
R3	1-249-441-11	CARBON	100K	5%	1/4W	
R4	1-249-435-11	CARBON	33K	5%	1/4W	
R5	1-249-429-11	CARBON	10K	5%	1/4W	
R6	1-249-429-11	CARBON	10K	5%	1/4W	
R7	1-249-429-11	CARBON	10K	5%	1/4W	
R8	1-249-421-11	CARBON	2.2K	5%	1/4W	
R9	1-249-431-11	CARBON	15K	5%	1/4W	
R10	1-249-438-11	CARBON	56K	5%	1/4W	
R11	1-249-417-11	CARBON	1K	5%	1/4W	
R12	1-249-421-11	CARBON	2.2K	5%	1/4W	
R13	1-249-448-11	CARBON	1.2	5%	1/4W	F
R14	1-249-448-11	CARBON	1.2	5%	1/4W	F
R15	1-216-372-11	METAL OXIDE	1.8	5%	2W	F
R16	1-249-429-11	CARBON	10K	5%	1/4W	
R17	1-249-429-11	CARBON	10K	5%	1/4W	
R18	1-216-460-11	METAL OXIDE	3.9K	5%	2W	F
R19	1-216-352-11	METAL OXIDE	1.8	5%	1W	F
R20	1-249-414-11	CARBON	560	5%	1/4W	
R21	1-249-425-11	CARBON	4.7K	5%	1/4W	
R22	1-249-426-11	CARBON	5.6K	5%	1/4W	
R23	1-247-852-11	CARBON	7.5K	5%	1/4W	
R24	1-249-436-11	CARBON	39K	5%	1/4W	
R25	1-249-434-11	CARBON	27K	5%	1/4W	
R26	1-249-429-11	CARBON	10K	5%	1/4W	
R27	1-249-429-11	CARBON	10K	5%	1/4W	
R28	1-249-434-11	CARBON	27K	5%	1/4W	
R29	1-249-427-11	CARBON	6.8K	5%	1/4W	
R31	1-215-433-00	METAL	3.3K	1%	1/4W	
R32	1-215-435-00	METAL	3.9K	1%	1/4W	
R33	1-249-429-11	CARBON	10K	5%	1/4W	
R34	1-249-417-11	CARBON	1K	5%	1/4W	
R35	1-249-432-11	CARBON	18K	5%	1/4W	
R37	1-249-429-11	CARBON	10K	5%	1/4W	
R38	1-249-429-11	CARBON	10K	5%	1/4W	
R39	1-215-900-11	METAL OXIDE	22K	5%	2W	F
R40	1-216-423-11	METAL OXIDE	27	5%	1W	F
R41	1-216-349-00	METAL OXIDE	1	5%	1W	F
R42	1-212-857-00	FUSIBLE	10	5%	1/4W	F
R43	1-249-417-11	CARBON	1K	5%	1/4W	
R44	1-215-473-00	METAL	150K	1%	1/4W	
R47	1-215-445-00	METAL	10K	1%	1/4W	
R49	1-249-448-11	CARBON	1.2	5%	1/4W	F
R50	1-249-429-11	CARBON	10K	5%	1/4W	
R51	1-249-417-11	CARBON	1K	5%	1/4W	
R52	1-249-405-11	CARBON	100	5%	1/4W	
R53	1-216-360-11	METAL OXIDE	8.2	5%	1W	F
R54	1-212-998-00	FUSIBLE	470	5%	1/2W	F
R55	1-249-417-11	CARBON	1K	5%	1/4W	
R56	1-249-419-11	CARBON	1.5K	5%	1/4W	
R57	1-249-419-11	CARBON	1.5K	5%	1/4W	

- The components identified by ⧗ in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

EA EB

Ref.No	Part No.	Description				Remark
R58	1-249-448-11	CARBON	1.2	5%	1/4W	F
R59	1-249-448-11	CARBON	1.2	5%	1/4W	F
R61	1-249-425-11	CARBON	4.7K	5%	1/4W	
R62	1-249-425-11	CARBON	4.7K	5%	1/4W	
R63	1-249-441-11	CARBON	100K	5%	1/4W	
R65	1-249-434-11	CARBON	27K	5%	1/4W	
R66	1-249-429-11	CARBON	10K	5%	1/4W	
R67	1-249-429-11	CARBON	10K	5%	1/4W	
R68	1-249-434-11	CARBON	27K	5%	1/4W	
R69	1-249-427-11	CARBON	6.8K	5%	1/4W	
R70	1-249-414-11	CARBON	560	5%	1/4W	
R71	1-215-461-00	METAL	47K	1%	1/4W	
R72	1-215-452-00	METAL	20K	1%	1/4W	
⧗R73	⚠	METAL			1/6W	
R74	1-215-447-00	METAL	12K	1%	1/4W	
⧗R75	⚠	METAL			1/6W	
R76	1-249-421-11	CARBON	2.2K	5%	1/4W	
R77	1-247-887-00	CARBON	220K	5%	1/4W	
R78	1-249-429-11	CARBON	10K	5%	1/4W	
R79	1-249-429-11	CARBON	10K	5%	1/4W	
R80	1-249-429-11	CARBON	10K	5%	1/4W	
R81	1-215-900-11	METAL OXIDE	22K	5%	2W	F
R82	1-216-356-00	METAL OXIDE	3.9	5%	1W	F
R83	1-216-348-00	METAL OXIDE	0.82	5%	1W	F
R84	1-249-417-11	CARBON	1K	5%	1/4W	
R85	1-249-417-11	CARBON	1K	5%	1/4W	
R86	1-215-948-00	METAL OXIDE	10K	5%	5W	F
R87	1-216-351-00	METAL OXIDE	1.5	5%	1W	F
R88	1-249-441-11	CARBON	100K	5%	1/4W	
R93	1-249-437-11	CARBON	47K	5%	1/4W	
R94	1-249-415-11	CARBON	680	5%	1/4W	
R125	1-216-377-11	METAL OXIDE	4.7	5%	2W	F
R126	1-216-377-11	METAL OXIDE	4.7	5%	2W	F
R127	1-202-719-00	SOLID	1M	10%	1/2W	
R160	1-249-425-11	CARBON	4.7K	5%	1/4W	
R161	1-249-422-11	CARBON	2.7K	5%	1/4W	
R162	1-249-441-11	CARBON	100K	5%	1/4W	
R163	1-249-435-11	CARBON	33K	5%	1/4W	
R170	1-249-415-11	CARBON	680	5%	1/4W	
R201	1-249-429-11	CARBON	10K	5%	1/4W	
R202	1-249-430-11	CARBON	12K	5%	1/4W	
R203	1-249-426-11	CARBON	5.6K	5%	1/4W	
R204	1-216-465-11	METAL OXIDE	27K	5%	2W	F
R205	1-247-802-11	CARBON	62	5%	1/4W	
R206	1-249-414-11	CARBON	560	5%	1/4W	
R207	1-249-448-11	CARBON	1.2	5%	1/4W	F
R208	1-249-448-11	CARBON	1.2	5%	1/4W	F
R209	1-215-889-00	METAL OXIDE	330	5%	2W	F
R210	1-216-375-00	METAL OXIDE	3.3	5%	2W	F
R211	1-249-429-11	CARBON	10K	5%	1/4W	
R212	1-249-425-11	CARBON	4.7K	5%	1/4W	
R213	1-247-719-11	CARBON	3.3K	5%	1/4W	F
R214	1-247-739-11	CARBON	100	5%	1/2W	F
R215	1-215-896-00	METAL OXIDE	4.7K	5%	2W	F
R216	1-249-429-11	CARBON	10K	5%	1/4W	
R217	1-249-429-11	CARBON	10K	5%	1/4W	
R301	1-215-948-00	WIREWOUND	10K	10%	5W	F

VARIABLE RESISTOR

Ref.No	Part No.	Description
RV1	1-237-514-21	RES, ADJ, CERMET 500

TRANSFORMER

Ref.No	Part No.	Description
T1	1-437-078-00	TRANSFORMER, HORIZONTAL DRIVE
T2	1-437-078-00	TRANSFORMER, HORIZONTAL DRIVE
T3	1-439-383-11	HOT
T4	1-437-078-00	TRANSFORMER, HORIZONTAL DRIVE
T5	1-439-384-11	LOT
T6	1-437-078-00	TRANSFORMER, HORIZONTAL DRIVE
T7	1-407-849-00	TRANSFORMER, D.F

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*1-631-685-11 EB BOARD
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CAPACITOR

Ref.No	Part No.	Description			
C71	1-124-120-11	ELECT	220MF	20%	16V
C73	1-108-634-11	MYLAR	0.047MF	10%	100V
C74	1-123-356-00	ELECT	10MF	20%	16V
C75	1-161-051-00	CERAMIC	0.01MF	10%	50V
C76	1-123-875-11	ELECT	10MF	20%	50V
C78	1-136-165-00	FILM	0.1MF	5%	50V
C82	1-161-051-00	CERAMIC	0.01MF	10%	50V
C83	1-124-907-11	ELECT	10MF	20%	50V
C84	1-123-330-00	ELECT	22MF	20%	16V
C85	1-136-165-00	FILM	0.1MF	5%	50V
C86	1-136-165-00	FILM	0.1MF	5%	50V
C91	1-124-120-11	ELECT	220MF	20%	16V
C93	1-124-907-11	ELECT	10MF	20%	50V
C94	1-123-330-00	ELECT	22MF	20%	16V
C95	1-124-666-11	ELECT	4.7MF	20%	200V
C96	1-123-356-00	ELECT	10MF	20%	25V

DIODE

Ref.No	Part No.	Description
D19	8-719-911-19	DIODE 1SS119
D20	8-719-911-19	DIODE 1SS119
D24	⚠8-759-157-40	IC UPC574J
D25	8-719-911-19	DIODE 1SS119
D26	8-719-911-19	DIODE 1SS119
D27	8-719-000-28	THYRISTOR CR02AM-8
D29	⚠8-759-157-40	IC UPC574J
D36	8-719-911-19	DIODE 1SS119
D51	8-719-000-28	THYRISTOR CR02AM-8

CONNECTOR

Ref.No	Part No.	Description
EB1	*1-565-480-11	CONNECTOR, BOARD TO BOARD 4P
EB2	*1-565-480-11	CONNECTOR, BOARD TO BOARD 4P

IC

Ref.No	Part No.	Description
IC4	8-759-981-64	IC NJM2903D
IC6	8-759-981-64	IC NJM2903D

TRANSISTOR

Ref.No	Part No.	Description
Q20	8-729-119-78	TRANSISTOR 2SC2785TP-HFE

RESISTOR

Ref.No	Part No.	Description				Remark
R89	1-249-431-11	CARBON	15K	5%	1/4W	
R90	1-249-417-11	CARBON	1K	5%	1/4W	
R95	1-249-429-11	CARBON	10K	5%	1/4W	
R96	1-249-421-11	CARBON	2.2K	5%	1/4W	
R97	1-249-393-11	CARBON	10	5%	1/4W	
R98	1-249-429-11	CARBON	10K	5%	1/4W	
R99	1-249-441-11	CARBON	100K	5%	1/4W	
R100	1-249-429-11	CARBON	10K	5%	1/4W	
R101	1-249-429-11	CARBON	10K	5%	1/4W	
R102	1-215-899-11	METAL OXIDE	15K	5%	2W	F
R103	1-215-899-11	METAL OXIDE	15K	5%	2W	F
R104	1-249-423-11	CARBON	3.3K	5%	1/4W	
R105	1-215-453-00	METAL	22K	1%	1/4W	
⧗R106	⚠	METAL			1/6W	

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Ne les remplacer que par une piece portant le numero specifie.

- The components identified by ⧗ in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

Ref.No	Part No.	Description			Remark	
R107	1-215-455-00	METAL	27K	1%	1/4W	
⧗R108	⚠	METAL			1/6W	
R111	1-249-441-11	CARBON	100K	5%	1/4W	
R112	1-249-423-11	CARBON	3.3K	5%	1/4W	
R113	1-215-455-00	METAL	27K	1%	1/4W	
R114	1-215-437-00	METAL	4.7K	1%	1/4W	
⧗R115	⚠	METAL			1/6W	
R116	1-215-486-00	METAL	510K	1%	1/4W	
R117	1-215-453-00	METAL	22K	1%	1/4W	
R118	1-215-469-00	METAL	100K	1%	1/4W	
R119	1-215-437-00	METAL	4.7K	1%	1/4W	
R120	1-215-437-00	METAL	4.7K	1%	1/4W	
R121	1-215-427-00	METAL	1.8K	1%	1/4W	
R122	1-215-437-00	METAL	4.7K	1%	1/4W	
R123	1-215-437-00	METAL	4.7K	1%	1/4W	
R124	1-215-427-00	METAL	1.8K	1%	1/4W	
R130	1-249-417-11	CARBON	1K	5%	1/4W	
R131	1-249-431-11	CARBON	15K	5%	1/4W	
R132	1-249-423-11	CARBON	3.3K	5%	1/4W	
R133	1-215-455-00	METAL	27K	1%	1/4W	
R134	1-215-437-00	METAL	4.7K	1%	1/4W	
⧗R135	⚠	METAL			1/6W	
R136	1-215-486-00	METAL	510K	1%	1/4W	
R137	1-215-453-00	METAL	22K	1%	1/4W	
R138	1-215-469-00	METAL	100K	1%	1/4W	
R140	1-215-899-11	METAL OXIDE	15K	5%	2W	F
R141	1-215-899-11	METAL OXIDE	15K	5%	2W	F
R145	1-249-413-11	CARBON	470	5%	1/4W	
R151	1-249-417-11	CARBON	1K	5%	1/4W	
R152	1-249-417-11	CARBON	1K	5%	1/4W	
R153	1-249-417-11	CARBON	1K	5%	1/4W	
R155	1-249-413-11	CARBON	470	5%	1/4W	
R156	1-249-423-11	CARBON	3.3K	5%	1/4W	

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*1-631-686-11 EC BOARD
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CAPACITOR

C97	1-124-907-11	ELECT	10MF	20%	50V
C98	1-124-907-11	ELECT	10MF	20%	50V
C210	1-102-824-00	CERAMIC	470PF	5%	50V
C211	1-136-165-00	FILM	0.1MF	5%	50V

DIODE

D210	8-719-911-19	DIODE 1SS119
D211	8-719-911-19	DIODE 1SS119
D212	8-719-911-19	DIODE 1SS119
D213	8-719-911-19	DIODE 1SS119

CONNECTOR

EC1	*1-565-480-11	CONNECTOR, BOARD TO BOARD 4P
EC2	*1-565-480-11	CONNECTOR, BOARD TO BOARD 4P

IC

IC201	8-759-145-58	IC UPC4558C

TRANSISTOR

Q210	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q211	8-729-119-76	TRANSISTOR 2SA1175-HFE

RESISTOR

Ref.No	Part No.	Description			Remark	
R220	1-249-429-11	CARBON	10K	5%	1/4W	
R221	1-249-429-11	CARBON	10K	5%	1/4W	
R222	1-249-429-11	CARBON	10K	5%	1/4W	
R223	1-247-848-11	CARBON	5.1K	5%	1/4W	
R224	1-216-423-11	METAL OXIDE	27	5%	1W	F
R225	1-249-431-11	CARBON	15K	5%	1/4W	
R226	1-249-431-11	CARBON	15K	5%	1/4W	
R227	1-249-456-11	CARBON	5.6	5%	1/4W	F
R228	1-249-456-11	CARBON	5.6	5%	1/4W	F
R229	1-215-867-00	METAL OXIDE	470	5%	1W	F

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*A-1316-090-A GA BOARD, COMPLETE (BVM-2015P ONLY)
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*A-1316-048-A GA BOARD, COMPLETE (BVM-2015PM ONLY)
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*A-1316-089-A GA BOARD, COMPLETE (BVM-1915 ONLY)
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⚠ 1-533-167-21	HOLDER, FUSE
⚠ 1-533-168-21	HOLDER, FUSE
1-535-316-11	TERMINAL, GROUND (M4)
⚠ 1-570-173-22	SWITCH, VOLTAGE CHANGE
⚠ *1-580-375-11	INLET 3P
*2-990-241-01	HOLDER (A), PLUG
*3-337-402-01	BAND, BINDING
*4-347-706-00	HEAT SINK (TR)
*4-371-879-02	COVER, AC SELECT
4-379-403-01	SPACER (G1), POLISHING
*4-379-408-01	INSULATOR (G3)
*4-379-409-01	NUT, PLATE
4-379-410-01	SPACER (G2), POLISHING
4-379-430-01	PANEL, POWER
*4-386-847-01	HEAT SINK (S.R.T)
*4-386-848-01	BAND (S.R.T)
*4-393-031-01	COVER, FUSE HOLDER
4-601-466-11	COVER, 3P INLET
7-682-550-04	SCREW P 3X12
7-682-552-04	SCREW P 3X16
7-682-554-04	SCREW P 3X25
7-682-560-04	SCREW P 4X6
7-682-247-04	SCREW K 3X6
7-682-547-09	SCREW B 3X6
7-682-547-04	SCREW BVTT 3X6 (S)
7-682-948-01	SCREW PSW 3X8
7-685-646-79	SCREW BVTP 3X8 TYPE2 IT-3

CAPACITOR

C1	1-124-024-00	ELECT	4.7MF	20%	350V
C2	1-124-024-00	ELECT	4.7MF	20%	350V
C3	1-162-117-00	CERAMIC	100PF	10%	500V
C4	1-162-117-00	CERAMIC	100PF	10%	500V
C5	1-162-117-00	CERAMIC	100PF	10%	500V
C6	1-162-117-00	CERAMIC	100PF	10%	500V
C7	1-126-104-11	ELECT	470MF	20%	25V
C8	1-126-105-11	ELECT	1000MF	20%	25V
C9	1-126-104-11	ELECT	470MF	20%	25V
C10	1-126-105-11	ELECT	1000MF	20%	25V
C11	1-126-104-11	ELECT	470MF	20%	25V
C12	1-124-602-00	ELECT	2200MF	20%	25V
C13	1-126-104-11	ELECT	470MF	20%	25V
C14	1-124-602-00	ELECT	2200MF	20%	25V
C15	1-124-360-00	ELECT	1000MF	20%	16V
C16	1-126-103-11	ELECT	470MF	20%	16V
C17	1-106-375-12	MYLAR	0.022MF	10%	100V
C18	1-108-638-11	MYLAR	0.1MF	10%	100V
C19	1-102-030-00	CERAMIC	330PF	10%	500V
C20	1-162-117-00	CERAMIC	100PF	10%	500V

GA

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Ref.No	Part No.	Description		Remark	
C21	1-102-038-00	CERAMIC	0.001MF		500V
C22	1-162-117-00	CERAMIC	100PF	10%	500V
C23	1-106-375-12	MYLAR	0.022MF	10%	100V
C24	1-108-638-11	MYLAR	0.1MF	10%	100V
C25	1-123-380-00	ELECT	1MF	20%	50V
C26	1-101-361-00	CERAMIC	150PF	5%	50V
C27	1-101-361-00	CERAMIC	150PF	5%	50V
C28	1-123-356-00	ELECT	10MF	20%	16V
C29	1-124-910-11	ELECT	47MF	20%	25V
C30	1-162-117-00	CERAMIC	100PF	10%	500V
C31	1-102-030-00	CERAMIC	330PF	10%	500V
C32	1-123-380-00	ELECT	1MF	20%	50V
C33	1-101-361-00	CERAMIC	150PF	5%	50V
C34	1-101-361-00	CERAMIC	150PF	5%	50V
C35	1-123-380-00	ELECT	1MF	20%	50V
C36	1-124-910-11	ELECT	47MF	20%	25V
C37	1-130-734-00	FILM	0.0068MF	5%	50V
C38	1-136-165-00	FILM	0.1MF	5%	50V
C39	1-136-165-00	FILM	0.1MF	5%	50V
C40	1-123-381-00	ELECT	2.2MF	20%	50V
C41	1-102-038-00	CERAMIC	0.001MF		500V
C42	1-136-165-00	FILM	0.1MF	5%	50V
C43	1-136-165-00	FILM	0.1MF	5%	50V
C44	1-123-356-00	ELECT	10MF	20%	16V
C45	1-162-132-00	CERAMIC	270PF	10%	2KV
C46	1-123-356-00	ELECT	10MF	20%	16V
C47	1-136-173-00	FILM	0.47MF	5%	50V
C48	1-136-173-00	FILM	0.47MF	5%	50V
C49	1-123-356-00	ELECT	10MF	20%	16V
C50	1-101-006-00	CERAMIC	0.047MF		50V
C51	1-101-006-00	CERAMIC	0.047MF		50V
C52	1-101-006-00	CERAMIC	0.047MF		50V
C53	1-101-006-00	CERAMIC	0.047MF		50V
C54	1-101-006-00	CERAMIC	0.047MF		50V
C55	1-123-356-00	ELECT	10MF	20%	16V
C56	1-136-201-11	FILM	0.22MF	5%	400V
C57	1-123-356-00	ELECT	10MF	20%	25V
C58	1-123-379-00	ELECT	0.47MF	20%	50V
C59	1-130-734-00	FILM	0.0068MF	5%	50V
C60	1-102-228-00	CERAMIC	470PF	10%	500V
C61	1-102-228-00	CERAMIC	470PF	10%	500V
C62	1-102-228-00	CERAMIC	470PF	10%	500V
C63	1-102-228-00	CERAMIC	470PF	10%	500V
C64	1-124-024-00	ELECT	4.7MF	20%	350V
C65	1-124-024-00	ELECT	4.7MF	20%	350V
C66	1-162-117-00	CERAMIC	100PF	10%	500V
C67	1-162-117-00	CERAMIC	100PF	10%	500V
C68	1-162-117-00	CERAMIC	100PF	10%	500V
C69	1-124-562-11	ELECT	47MF	20%	200V
C70	1-124-171-00	ELECT	100MF	20%	160V
C71	1-162-117-00	CERAMIC	100PF	10%	500V
C72	1-124-562-11	ELECT	47MF	20%	200V
C73	1-124-171-00	ELECT	100MF	20%	160V
C74	1-124-122-11	ELECT	100MF	20%	16V
C75	1-124-122-11	ELECT	100MF	20%	16V
C76	⚠1-161-953-52	CERAMIC	0.0047MF	20%	400V
C77	⚠1-161-953-52	CERAMIC	0.0047MF	20%	400V
C78	1-162-599-12	CERAMIC	0.0047MF	20%	400V
C79	1-162-599-12	CERAMIC	0.0047MF	20%	400V
C80	1-125-658-11	ELECT	560MF	20%	250V
C81	1-125-658-11	ELECT	560MF	20%	250V
C82	1-123-369-00	ELECT	4.7MF	20%	25V
C83	1-101-004-00	CERAMIC	0.01MF		50V
C84	⚠1-136-311-51	FILM	0.47MF	20%	125V
				(BVM-1915/2015PM ONLY)	
	⚠1-136-311-61	FILM	0.47MF	20%	300V
				(BVM-2015P ONLY)	
C85	⚠1-161-953-52	CERAMIC	0.0047MF	20%	400V
C86	⚠1-161-953-52	CERAMIC	0.0047MF	20%	400V
C87	⚠1-161-953-52	CERAMIC	0.0047MF	20%	400V
C88	⚠1-161-953-52	CERAMIC	0.0047MF	20%	400V
C89	⚠1-136-311-51	FILM	0.47MF	20%	125V
				(BVM-1915/2015PM ONLY)	
	⚠1-136-311-61	FILM	0.47MF	20%	300V
				(BVM-2015P ONLY)	
C90	1-136-171-00	FILM	0.033MF	5%	50V
C91	1-162-599-12	CERAMIC	0. 0047	20%	400V
				(BVM-2015P ONLY)	
C92	1-136-171-00	FILM	0.033MF	5%	50V
C93	1-162-599-12	CERAMIC	0. 0047	20%	400V
				(BVM-2015P ONLY)	
C94	1-102-038-00	CERAMIC	0.001MF		500V
C95	1-136-173-00	FILM	0.47MF	5%	50V
C96	1-102-050-00	CERAMIC	0.01MF	99%	500V
C97	1-136-173-00	FILM	0.47MF	5%	50V
C98	1-136-173-00	FILM	0.47MF	5%	50V
C99	1-102-050-00	CERAMIC	0.01MF	99%	500V
C100	1-162-117-00	CERAMIC	100PF	10%	500V
C101	1-162-117-00	CERAMIC	100PF	10%	500V
C102	1-136-601-11	FILM	0.01MF	5%	630V
C103	1-136-601-11	FILM	0.01MF	5%	630V

DIODE

D1	8-719-912-51	DIODE ESAC25-04C
D2	8-719-918-73	DIODE ESAC25-04N
D3	8-719-901-73	DIODE ESAD25-04D
D4	8-719-901-73	DIODE ESAD25-04D
D5	8-719-907-24	DIODE ESAC31-02D
D6	8-719-907-24	DIODE ESAC31-02D
D7	8-719-300-33	DIODE RU-3AM
D8	8-719-300-52	DIODE CTU-38R
D9	8-719-300-53	DIODE CTU-38S
D10	8-719-912-51	DIODE ESAC25-04C
D11	8-719-918-73	DIODE ESAC25-04N
D12	8-719-911-19	DIODE 1SS119
D13	8-719-911-19	DIODE 1SS119
D14	8-719-100-58	DIODE RD10EB3
D15	8-719-911-19	DIODE 1SS119
D16	8-719-911-19	DIODE 1SS119
D17	8-719-911-19	DIODE 1SS119
D18	8-719-109-89	DIODE RD5.6ES-B2
D20	8-719-200-02	DIODE 10E-2
D21	⚠8-719-300-07	DIODE RB406N
D22	8-759-157-40	IC UPC574J
D23	8-719-911-19	DIODE 1SS119
D24	8-719-100-58	DIODE RD10EB3
D25	8-719-911-19	DIODE 1SS119
D26	8-719-003-08	THYRISTOR CR3CM-8
D27	8-719-981-00	DIODE ERC81-004
D28	8-719-981-00	DIODE ERC81-004
D29	8-719-981-00	DIODE ERC81-004
D30	8-719-981-00	DIODE ERC81-004
D31	8-719-300-33	DIODE RU-3AM
D32	8-719-300-33	DIODE RU-3AM

CONNECTOR

GA1	1-506-348-XX	PIN, CONNECTOR 3P
GA2	*1-506-371-00	PIN, CONNECTOR 2P
GA3	1-508-768-00	PIN, CONNECTOR (5MM PITCH) 6P
GA4	*1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P
GA5	*1-566-055-11	PIN, CONNECTOR 3P
GA6	*1-566-055-11	PIN, CONNECTOR 3P
GA7	*1-566-058-11	PIN, CONNECTOR 6P

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GA

Ref.No	Part No.	Description	Remark
GA8	*1-566-057-11	PIN, CONNECTOR 5P	

IC

Ref.No	Part No.	Description	Remark
IC1	1-806-805-11	IC MC5433	
IC2	8-759-904-94	IC TL494CN	
IC3	8-759-904-94	IC TL494CN	

COIL

Ref.No	Part No.	Description	Remark
L3	1-459-643-11	COIL, CHOKE 525UH	
L4	1-459-643-11	COIL, CHOKE 525UH	
L5	1-459-643-11	COIL, CHOKE 525UH	
L6	1-459-643-11	COIL, CHOKE 525UH	
L7	1-459-207-00	COIL, CORE	
L8	1-459-644-11	COIL, CHOKE 2.9MMH	
L9	1-459-645-11	COIL, CHOKE 20MMH	
L10	1-421-329-00	COIL, CHOKE	
L11	1-421-329-00	COIL, CHOKE	
L12	1-421-329-00	COIL, CHOKE	
L13	1-421-329-00	COIL, CHOKE	
L14	1-421-329-00	COIL, CHOKE	
L15	1-421-329-00	COIL, CHOKE	
L16	1-421-329-00	COIL, CHOKE	
L17	⚠1-421-590-11	TRANSFORMER, LINE FILTER	
L18	⚠1-421-590-11	TRANSFORMER, LINE FILTER	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q1	8-729-301-76	TRANSISTOR STR8124-R	
Q2	8-729-301-76	TRANSISTOR STR8124-R	
Q3	8-729-140-96	TRANSISTOR 2SD774-34	
Q4	8-729-140-96	TRANSISTOR 2SD774-34	
Q5	8-729-140-96	TRANSISTOR 2SD774-34	
Q6	8-729-140-96	TRANSISTOR 2SD774-34	
Q7	8-729-140-97	TRANSISTOR 2SB734-34	
Q8	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q9	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q10	8-729-313-42	TRANSISTOR 2SD1134-C	
Q11	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q12	8-729-140-96	TRANSISTOR 2SD774-34	
Q13	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q14	8-729-119-78	TRANSISTOR 2SC2785-HFE	

RESISTOR

Ref.No	Part No.	Description				Remark
R1	1-215-857-11	METAL OXIDE	10	5%	1W	F
R2	1-215-857-11	METAL OXIDE	10	5%	1W	F
R3	1-247-715-11	CARBON	1.5K	5%	1/4W	
R4	1-215-857-11	METAL OXIDE	10	5%	1W	F
R5	1-215-857-11	METAL OXIDE	10	5%	1W	F
R6	1-249-447-11	CARBON	1	5%	1/4W	F
R7	1-247-692-11	CARBON	22	5%	1/4W	
R8	1-249-418-11	CARBON	1.2K	5%	1/4W	
R9	1-249-382-11	CARBON	1.2	5%	1/4W	F
R10	1-249-447-11	CARBON	1	5%	1/4W	F
R11	1-247-692-11	CARBON	22	5%	1/4W	
R12	1-249-418-11	CARBON	1.2K	5%	1/4W	
R13	1-215-866-11	METAL OXIDE	330	5%	1W	F
R14	1-247-700-11	CARBON	100	5%	1/4W	
R15	1-247-709-11	CARBON	510	5%	1/4W	
R16	1-247-709-11	CARBON	510	5%	1/4W	
R17	1-247-700-11	CARBON	100	5%	1/4W	
R18	1-249-425-11	CARBON	4.7K	5%	1/4W	
R19	1-249-419-11	CARBON	1.5K	5%	1/4W	
R20	1-247-838-00	CARBON	2K	5%	1/4W	
R21	1-249-417-11	CARBON	1K	5%	1/4W	
R22	1-249-409-11	CARBON	220	5%	1/4W	
R23	1-249-417-11	CARBON	1K	5%	1/4W	
R24	1-249-421-11	CARBON	2.2K	5%	1/4W	
R25	1-249-409-11	CARBON	220	5%	1/4W	
R26	1-247-700-11	CARBON	100	5%	1/4W	
R27	1-247-713-11	CARBON	1K	5%	1/4W	
R28	1-247-713-11	CARBON	1K	5%	1/4W	
R29	1-247-700-11	CARBON	100	5%	1/4W	
R30	1-215-886-11	METAL OXIDE	100	5%	2W	F
R31	1-215-886-11	METAL OXIDE	100	5%	2W	F
R32	1-215-886-11	METAL OXIDE	100	5%	2W	F
R33	1-247-697-11	CARBON	56	5%	1/4W	F
R34	1-247-697-11	CARBON	56	5%	1/4W	F
R35	1-215-863-11	METAL OXIDE	100	5%	1W	F
R36	1-249-425-11	CARBON	4.7K	5%	1/4W	
R37	1-249-420-11	CARBON	1.8K	5%	1/4W	
R38	1-249-429-11	CARBON	10K	5%	1/4W	
R39	1-249-413-11	CARBON	470	5%	1/4W	
R40	1-215-453-00	METAL	22K	1%	1/4W	
R41	1-249-425-11	CARBON	4.7K	5%	1/4W	
R42	1-215-437-00	METAL	4.7K	1%	1/4W	
R43	1-215-435-00	METAL	3.9K	1%	1/4W	
R44	1-215-427-00	METAL	1.8K	1%	1/4W	
R45	1-247-713-11	CARBON	1K	5%	1/4W	
R46	1-249-417-11	CARBON	1K	5%	1/4W	
R47	1-216-995-11	METAL	820	1%	10W	
R48	1-215-866-11	METAL OXIDE	330	5%	1W	F
⧗R52	⚠	METAL OXIDE			2W	F
⧗R53	⚠	METAL			1/4W	
R54	1-215-901-00	METAL OXIDE	33K	5%	2W	F
R55	1-215-426-00	METAL	1.6K	1%	1/4W	
R60	1-249-420-11	CARBON	1.8K	5%	1/4W	
R61	1-249-420-11	CARBON	1.8K	5%	1/4W	
R62	1-249-429-11	CARBON	10K	5%	1/4W	
R64	1-249-426-11	CARBON	5.6K	5%	1/4W	
R65	1-215-437-00	METAL	4.7K	1%	1/4W	
R66	1-215-453-00	METAL	22K	1%	1/4W	
⧗R67	⚠	METAL			1/2W	
⧗R68	⚠	METAL			1/4W	
R74	1-215-889-00	METAL OXIDE	330	5%	2W	F
R74	1-215-889-00	METAL OXIDE	330	5%	2W	F
R77	1-215-433-00	METAL	3.3K	1%	1/4W	
R78	1-215-433-00	METAL	3.3K	1%	1/4W	
R80	⚠1-202-643-35	SOLID	820K	10%	1/2W	
R81	1-215-461-00	METAL	47K	1%	1/4W	
R82	1-215-461-00	METAL	47K	1%	1/4W	
R83	1-215-461-00	METAL	47K	1%	1/4W	
R84	1-215-459-00	METAL	39K	1%	1/4W	
R85	1-215-449-00	METAL	15K	1%	1/4W	
R86	1-215-437-00	METAL	4.7K	1%	1/4W	
R87	1-249-405-11	CARBON	100	5%	1/4W	
R88	1-249-433-11	CARBON	22K	5%	1/4W	
R89	1-249-429-11	CARBON	10K	5%	1/4W	
R90	1-249-429-11	CARBON	10K	5%	1/4W	
R91	1-249-429-11	CARBON	10K	5%	1/4W	
R92	⚠1-217-295-11	WIREWOUND	5.6	10%	5W	F
R93	1-215-886-11	METAL OXIDE	100	5%	2W	F
R94	1-205-538-00	WIREWOUND	4.7	10%	10W	
R95	1-215-904-11	METAL OXIDE	100K	5%	2W	F
R96	1-215-904-11	METAL OXIDE	100K	5%	2W	F
R97	1-215-904-11	METAL OXIDE	100K	5%	2W	F
R98	1-215-904-11	METAL OXIDE	100K	5%	2W	F

VARIABLE RESISTOR

Ref.No	Part No.	Description	Remark
RV1	1-237-514-21	RES, ADJ, CERMET 500	
RV2	1-237-515-21	RES, ADJ, CERMET 1K	

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

GA GB GC

RELAY

Ref.No	Part No.	Description	Remark
RY1	⚠1-515-805-11	RELAY, POWER	

TRANSFORMER

Ref.No	Part No.	Description	Remark
T1	⚠1-448-433-11	TRANSFORMER, CONVERTER (S.R.T)	
T2	⚠1-447-106-11	TRANSFORMER, DRIVE	
T3	⚠1-421-624-12	TRANSFORMER, CURRENT	
T4	⚠1-447-426-12	TRANSFORMER, CONVERTER	
T5	⚠1-448-432-12	TRANSFORMER, CONVERTER (S.R.T)	
T6	⚠1-447-106-11	TRANSFORMER, DRIVE	
T7	⚠1-421-624-12	TRANSFORMER, CURRENT	

THERMISTOR

Ref.No	Part No.	Description	Remark
TH1	⚠1-800-820-12	THERMISTOR, POWER	

THERMISTOR

Ref.No	Part No.	Description	Remark
THP1	⚠1-806-387-12	THERMISTOR (POSITIVE)	
THP2	⚠1-800-686-33	THERMISTOR (POSITIVE)	

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*1-627-679-11 GB BOARD

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CAPACITOR

Ref.No	Part No.	Description				Remark
C1	1-123-380-00	ELECT	1MF	20%	50V	
C2	1-123-380-00	ELECT	1MF	20%	50V	

DIODE

Ref.No	Part No.	Description	Remark
D1	8-719-911-19	DIODE 1SS119	
D2	8-719-110-08	DIODE RD8.2ES-B2	
D3	8-719-911-19	DIODE 1SS119	
D4	8-719-911-19	DIODE 1SS119	
D5	8-719-911-19	DIODE 1SS119	
D6	8-719-110-08	DIODE RD8.2ES-B2	
D7	8-719-812-41	DIODE TLR124	
D8	8-719-911-19	DIODE 1SS119	
D9	8-719-911-19	DIODE 1SS119	
D10	8-719-812-41	DIODE TLR124	
D11	8-719-110-08	DIODE RD8.2ES-B2	
D12	8-719-911-19	DIODE 1SS119	
D13	8-719-911-19	DIODE 1SS119	
D14	8-719-911-19	DIODE 1SS119	
D15	8-719-911-19	DIODE 1SS119	
D16	8-719-911-19	DIODE 1SS119	
D17	8-719-110-08	DIODE RD8.2ES-B2	
D18	8-719-911-19	DIODE 1SS119	
D19	8-719-911-19	DIODE 1SS119	

CONNECTOR

Ref.No	Part No.	Description	Remark
GA1	*1-506-603-11	PLUG, L TYPE (2.0MM PITCH) 10P	

TRANSISTOR

Ref.No	Part No.	Description	Remark
Q1	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q2	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q3	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q4	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q5	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q6	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q7	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q8	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q9	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q10	8-729-119-78	TRANSISTOR 2SC2785-HFE	

RESISTOR

Ref.No	Part No.	Description				Remark
R1	1-249-427-11	CARBON	6.8K	5%	1/4W	
R2	1-249-428-11	CARBON	8.2K	5%	1/4W	
R3	1-249-429-11	CARBON	10K	5%	1/4W	
R4	1-249-427-11	CARBON	6.8K	5%	1/4W	
R5	1-249-420-11	CARBON	1.8K	5%	1/4W	
R6	1-249-427-11	CARBON	6.8K	5%	1/4W	
R7	1-249-420-11	CARBON	1.8K	5%	1/4W	
R8	1-249-429-11	CARBON	10K	5%	1/4W	
R9	1-249-427-11	CARBON	6.8K	5%	1/4W	
R10	1-249-428-11	CARBON	8.2K	5%	1/4W	
R11	1-249-424-11	CARBON	3.9K	5%	1/4W	
R12	1-249-421-11	CARBON	2.2K	5%	1/4W	
R13	1-249-425-11	CARBON	4.7K	5%	1/4W	
R14	1-249-421-11	CARBON	2.2K	5%	1/4W	
R15	1-249-424-11	CARBON	3.9K	5%	1/4W	
R16	1-249-421-11	CARBON	2.2K	5%	1/4W	
R17	1-249-425-11	CARBON	4.7K	5%	1/4W	
R18	1-249-421-11	CARBON	2.2K	5%	1/4W	
R19	1-249-429-11	CARBON	10K	5%	1/4W	
R20	1-249-429-11	CARBON	10K	5%	1/4W	
R21	1-249-429-11	CARBON	10K	5%	1/4W	
R22	1-249-423-11	CARBON	3.3K	5%	1/4W	
R23	1-249-423-11	CARBON	3.3K	5%	1/4W	
R24	1-249-429-11	CARBON	10K	5%	1/4W	
R25	1-249-429-11	CARBON	10K	5%	1/4W	

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*1-617-885-11 GC BOARD

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CAPACITOR

Ref.No	Part No.	Description				Remark
C1	1-123-330-00	ELECT	22MF	20%	25V	
C2	1-123-330-00	ELECT	22MF	20%	25V	
C3	1-123-330-00	ELECT	22MF	20%	25V	
C4	1-123-330-00	ELECT	22MF	20%	25V	
C5	1-123-330-00	ELECT	22MF	20%	25V	
C6	1-123-330-00	ELECT	22MF	20%	25V	
C7	1-123-330-00	ELECT	22MF	20%	25V	
C8	1-123-330-00	ELECT	22MF	20%	25V	
C9	1-123-330-00	ELECT	22MF	20%	25V	
C12	1-101-004-00	CERAMIC	0.01MF		50V	
C14	1-101-004-00	CERAMIC	0.01MF		50V	
C16	1-101-004-00	CERAMIC	0.01MF		50V	
C17	1-101-004-00	CERAMIC	0.01MF		50V	
C18	1-101-004-00	CERAMIC	0.01MF		50V	

CONNECTOR

Ref.No	Part No.	Description	Remark
GC1	*1-566-044-11	PIN, CONNECTOR 5P	
GC2	*1-566-057-11	PIN, CONNECTOR 5P	
GC3	*1-566-044-11	PIN, CONNECTOR 5P	

IC

Ref.No	Part No.	Description	Remark
IC1	8-759-929-65	IC UPC7912H	
IC2	8-759-929-65	IC LM7912CT	
IC3	8-759-929-62	IC LM7812CT	
IC4	8-759-929-62	IC LM7812CT	

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Ref.No	Part No.	Description			Remark
	*1-631-683-11	HA BOARD *******			

CONNECTOR

Ref.No	Part No.	Description			Remark
HA301	*1-566-055-11	PIN, CONNECTOR 3P			
HA302	*1-566-056-11	PIN, CONNECTOR 4P			
HA303	*1-566-064-11	PIN, CONNECTOR 12P			
HA304	*1-566-054-11	PIN, CONNECTOR 2P			

RESISTOR

Ref.No	Part No.	Description			Remark
R301	1-247-814-11	CARBON	200	5%	1/4W
R302	1-215-469-00	METAL	100K	1%	1/4W

VARIABLE RESISTOR

Ref.No	Part No.	Description			Remark
RV301	1-237-519-21	RES, ADJ, CERMET 20K			

SWITCH

Ref.No	Part No.	Description			Remark
S301	1-570-565-11	SWITCH, PUSH (10 KEY)			

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Ref.No	Part No.	Description			Remark
	*1-627-680-11	HB BOARD *******			
	1-570-568-11	SWITCH, PUSH (4 KEY)			
	1-570-569-11	SWITCH, PUSH (3 KEY)			

CAPACITOR

Ref.No	Part No.	Description			Remark
C1	1-124-034-51	ELECT	33MF	20%	16V
C2	1-124-034-51	ELECT	33MF	20%	16V
C3	1-101-004-00	CERAMIC	0.01MF		50V
C4	1-101-004-00	CERAMIC	0.01MF		50V
C5	1-101-004-00	CERAMIC	0.01MF		50V
C6	1-101-004-00	CERAMIC	0.01MF		50V
C7	1-101-004-00	CERAMIC	0.01MF		50V

DIODE

Ref.No	Part No.	Description			Remark
D1	8-719-938-68	DIODE GL3HY8			
D2	8-719-938-68	DIODE GL3HY8			
D3	8-719-938-68	DIODE GL3HY8			
D4	8-719-938-68	DIODE GL3HY8			
D5	8-719-812-43	DIODE TLG124A			
D6	8-719-812-43	DIODE TLG124A			
D7	8-719-812-43	DIODE TLG124A			

CONNECTOR

Ref.No	Part No.	Description			Remark
HB1	*1-566-064-11	PIN, CONNECTOR 12P			
HB2	*1-566-062-11	PIN, CONNECTOR 10P			
HB3	*1-566-060-11	PIN, CONNECTOR 8P			
HB4	*1-566-064-11	PIN, CONNECTOR 12P			
HB5	*1-566-058-11	PIN, CONNECTOR 6P			
HB6	*1-566-064-11	PIN, CONNECTOR 12P			

RESISTOR

Ref.No	Part No.	Description			Remark
R1	1-215-469-00	METAL	100K	1%	1/4W
R2	1-215-469-00	METAL	100K	1%	1/4W
R3	1-215-469-00	METAL	100K	1%	1/4W
R4	1-215-469-00	METAL	100K	1%	1/4W
R5	1-215-469-00	METAL	100K	1%	1/4W
R6	1-215-469-00	METAL	100K	1%	1/4W
R7	1-215-469-00	METAL	100K	1%	1/4W
R8	1-215-469-00	METAL	100K	1%	1/4W
R9	1-215-469-00	METAL	100K	1%	1/4W
R10	1-215-469-00	METAL	100K	1%	1/4W
R11	1-215-469-00	METAL	100K	1%	1/4W
R12	1-249-425-11	CARBON	4.7K	5%	1/4W
R13	1-249-423-11	CARBON	3.3K	5%	1/4W
R15	1-249-423-11	CARBON	3.3K	5%	1/4W
R16	1-249-423-11	CARBON	3.3K	5%	1/4W
R17	1-249-423-11	CARBON	3.3K	5%	1/4W

VARIABLE RESISTOR

Ref.No	Part No.	Description			Remark
RV1	1-237-519-21	RES, ADJ, CERMET 20K			
RV2	1-237-519-21	RES, ADJ, CERMET 20K			
RV3	1-237-519-21	RES, ADJ, CERMET 20K			
RV4	1-237-519-21	RES, ADJ, CERMET 20K			
RV5	1-237-520-21	RES, ADJ, CERMET 50K			
RV6	1-237-520-21	RES, ADJ, CERMET 50K			
RV7	1-237-520-21	RES, ADJ, CERMET 50K			
RV8	1-237-520-21	RES, ADJ, CERMET 50K			
RV9	1-237-520-21	RES, ADJ, CERMET 50K			
RV10	1-237-520-21	RES, ADJ, CERMET 50K			
RV11	1-237-520-21	RES, ADJ, CERMET 50K			
RV12	1-237-521-21	RES, ADJ, CERMET 100K			

SWITCH

Ref.No	Part No.	Description			Remark
S8	1-570-509-11	SWITCH, TOGGLE			
S9	1-570-509-11	SWITCH, TOGGLE			
S10	1-570-509-11	SWITCH, TOGGLE			
S11	1-570-510-11	SWITCH, TOGGLE			
S12	1-570-509-11	SWITCH, TOGGLE			
S13	1-570-509-11	SWITCH, TOGGLE			
S14	1-570-512-11	SWITCH, TOGGLE			
S15	1-570-509-11	SWITCH, TOGGLE			

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Ref.No	Part No.	Description			Remark
	*1-617-887-11	HC BOARD *******			

SWITCH

Ref.No	Part No.	Description			Remark
SW1	1-570-567-21	SWITCH, PUSH (2 KEY)			
SW2	1-570-567-21	SWITCH, PUSH (2 KEY)			
SW3	1-570-567-11	SWITCH, PUSH (2 KEY)			
SW4	1-570-567-11	SWITCH, PUSH (2 KEY)			

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Ref.No	Part No.	Description			Remark
	*1-618-814-11	HE BOARD *******			

CAPACITOR

Ref.No	Part No.	Description			Remark
C1	1-101-004-00	CERAMIC	0.01MF		50V
C5	1-124-589-11	ELECT	47MF	20%	16V
C6	1-124-589-11	ELECT	47MF	20%	16V
C7	1-136-161-00	FILM	0.047MF	5%	50V

DIODE

Ref.No	Part No.	Description			Remark
D1	8-719-109-89	DIODE RD5.6ES-B2			
D2	8-719-109-89	DIODE RD5.6ES-B2			
D3	8-719-109-89	DIODE RD5.6ES-B2			
D4	8-719-109-89	DIODE RD5.6ES-B2			
D5	8-719-109-89	DIODE RD5.6ES-B2			
D6	8-719-109-89	DIODE RD5.6ES-B2			
D7	8-719-109-89	DIODE RD5.6ES-B2			
D8	8-719-110-36	DIODE RD13ES-B2			
D9	8-719-110-36	DIODE RD13ES-B2			
D10	8-719-110-36	DIODE RD13ES-B2			
D11	8-719-110-36	DIODE RD13ES-B2			

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Ref.No	Part No.	Description			Remark
		CONNECTOR			
HE1	*1-566-065-31	PIN, CONNECTOR 13P			
HE2	*1-566-059-11	PIN, CONNECTOR 7P			
HE3	*1-566-054-11	PIN, CONNECTOR 2P			
HE4	*1-566-064-11	PIN, CONNECTOR 12P			
		RESISTOR			
R1	1-247-887-00	CARBON	220K	5%	1/4W
R2	1-247-889-00	CARBON	270K	5%	1/4W
R10	1-247-700-11	CARBON	100	5%	1/4W
R11	1-247-700-11	CARBON	100	5%	1/4W
R12	1-247-700-11	CARBON	100	5%	1/4W
R13	1-247-700-11	CARBON	100	5%	1/4W
R14	1-247-700-11	CARBON	100	5%	1/4W
R15	1-247-700-11	CARBON	100	5%	1/4W
R16	1-247-700-11	CARBON	100	5%	1/4W
		SWITCH			
S1	1-554-724-11	SWITCH, PUSH (1 KEY)			
S2	1-554-724-11	SWITCH, PUSH (1 KEY)			
S3	1-554-724-11	SWITCH, PUSH (1 KEY)			
S4	1-554-724-11	SWITCH, PUSH (1 KEY)			
S5	1-554-724-11	SWITCH, PUSH (1 KEY)			

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	*1-623-001-11	HF BOARD			
		*******			
		CONNECTOR			
HF1	1-562-221-71	RECEPTACLE, CONNECTOR 12P			

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	*1-627-681-11	HG BOARD			
		*******			
	*4-026-910-00	HOLDER, LED			
		DIODE			
D1	8-719-938-68	DIODE SL3HY8			
D2	8-719-812-41	DIODE TLR124			
		RESISTOR			
R1	1-215-465-00	METAL	68K	1%	1/4W
R2	1-215-451-00	METAL	18K	1%	1/4W
R3	1-215-469-00	METAL	100K	1%	1/4W
R4	1-215-469-00	METAL	100K	1%	1/4W
R5	1-249-425-11	CARBON	4.7K	5%	1/4W
		SWITCH			
SW1	1-570-566-11	SWITCH, PUSH (4 KEY)			

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	*1-627-682-11	HH BOARD			
		*******			
	1-566-614-11	PLUG (L TYPE) 3P			
	7-682-547-09	SCREW BVTT 3X6 (S)			
		VARIABLE RESISTOR			
RV1	1-238-332-11	RES, VAR, CARBON 20K			
RV2	1-238-332-11	RES, VAR, CARBON 20K			
RV3	1-238-332-11	RES, VAR, CARBON 20K			
RV4	1-238-332-11	RES, VAR, CARBON 20K			

Ref.No	Part No.	Description			Remark
	*1-631-678-11	P BOARD			
		******			
	1-202-826-00	SOLID	4.7K	10%	1/2W
	⚠1-439-382-21	TRANSFORMER ASSY, FLYBACK			
	1-631-678-11	PC BOARD, P			
		COIL			
L11	1-459-215-00	COIL (WITH CORE)			

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	*1-617-895-11	QA BOARD			
		*******			
		CAPACITOR			
C1	1-108-692-11	MYLAR	0.01MF	10%	200V
C2	1-126-235-11	ELECT	100MF	20%	16V
C3	1-101-004-00	CERAMIC	0.01MF		50V
C4	1-108-692-11	MYLAR	0.01MF	10%	200V
C5	1-126-235-11	ELECT	100MF	20%	16V
C6	1-101-004-00	CERAMIC	0.01MF		50V
C7	1-108-692-11	MYLAR	0.01MF	10%	200V
C8	1-126-235-11	ELECT	100MF	20%	16V
C9	1-101-004-00	CERAMIC	0.01MF		50V
C10	1-102-951-00	CERAMIC	15PF	5%	50V
C11	1-102-951-00	CERAMIC	15PF	5%	50V
C12	1-102-951-00	CERAMIC	15PF	5%	50V
		RESISTOR			
R1	1-215-449-00	METAL	15K	1%	1/4W
R2	1-215-449-00	METAL	15K	1%	1/4W
R3	1-249-439-11	CARBON	68K	5%	1/4W
		SWITCH			
S1	1-570-857-11	SWITCH, SLIDE			
S2	1-570-857-11	SWITCH, SLIDE			
S3	1-570-857-11	SWITCH, SLIDE			

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	*1-618-786-11	QB BOARD			
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		CAPACITOR			
C1	1-108-692-11	MYLAR	0.01MF	10%	200V
C2	1-126-235-11	ELECT	100MF	20%	16V
C3	1-101-004-00	CERAMIC	0.01MF		50V
C4	1-108-692-11	MYLAR	0.01MF	10%	200V
C5	1-126-235-11	ELECT	100MF	20%	16V
C6	1-101-004-00	CERAMIC	0.01MF		50V
C7	1-108-692-11	MYLAR	0.01MF	10%	200V
C8	1-126-235-11	ELECT	100MF	20%	16V
C9	1-101-004-00	CERAMIC	0.01MF		50V
C10	1-102-951-00	CERAMIC	15PF	5%	50V
C11	1-102-951-00	CERAMIC	15PF	5%	50V
C12	1-102-951-00	CERAMIC	15PF	5%	50V
		RESISTOR			
R1	1-215-449-00	METAL	15K	1%	1/4W
R2	1-215-449-00	METAL	15K	1%	1/4W
R3	1-215-449-00	METAL	15K	1%	1/4W

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

QB TB V W XB Y

SWITCH

Ref.No	Part No.	Description	Remark
S1	1-570-857-11	SWITCH, SLIDE	
S2	1-570-857-11	SWITCH, SLIDE	
S3	1-570-857-11	SWITCH, SLIDE	

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*1-617-899-11 TB BOARD
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CONNECTOR

Ref.No	Part No.	Description	Remark
CN1	*1-564-431-11	POST, CONNECTOR 3P	
CN2	*1-564-431-11	POST, CONNECTOR 3P	
CN11	*1-561-724-00	SOCKET, CONNECTOR 2P	
CN12	*1-561-724-00	SOCKET, CONNECTOR 2P	
TB4	*1-566-054-11	PIN, CONNECTOR 2P	
TB5	*1-566-054-11	PIN, CONNECTOR 2P	
TB6	*1-566-060-11	PIN, CONNECTOR 8P	
TB7	*1-566-054-11	PIN, CONNECTOR 2P	
TB8	*1-566-058-11	PIN, CONNECTOR 6P	
TB9	*1-566-060-11	PIN, CONNECTOR 8P	
TB10	*1-566-064-11	PIN, CONNECTOR 12P	
TB11	*1-566-055-11	PIN, CONNECTOR 3P	
TB12	*1-566-064-11	PIN, CONNECTOR 12P	
TB13	*1-566-062-11	PIN, CONNECTOR 10P	
TB14	*1-566-064-11	PIN, CONNECTOR 12P	
TB15	*1-566-060-11	PIN, CONNECTOR 8P	
TB16	*1-566-057-11	PIN, CONNECTOR 5P	
TB17	*1-566-057-11	PIN, CONNECTOR 5P	
TB18	*1-566-055-11	PIN, CONNECTOR 3P	
TB19	*1-566-056-11	PIN, CONNECTOR 4P	
TB20	*1-566-056-11	PIN, CONNECTOR 4P	
TB21	*1-566-056-11	PIN, CONNECTOR 4P	
TB22	*1-566-054-11	PIN, CONNECTOR 2P	
TB23	*1-566-054-11	PIN, CONNECTOR 2P	
TB24	*1-566-054-11	PIN, CONNECTOR 2P	
TB28	*1-566-062-11	PIN, CONNECTOR 10P	
TB31	*1-561-337-00	CONNECTOR, MULTI	
TB32	*1-561-337-00	CONNECTOR, MULTI	
TB33	*1-561-337-00	CONNECTOR, MULTI	
TB34	*1-561-337-00	CONNECTOR, MULTI	
TB35	*1-561-337-00	CONNECTOR, MULTI	
TB36	*1-561-337-00	CONNECTOR, MULTI	
TB37	*1-561-337-00	CONNECTOR, MULTI	
TB38	*1-561-337-00	CONNECTOR, MULTI	
TB39	*1-561-337-00	CONNECTOR, MULTI	
TB40	*1-561-337-00	CONNECTOR, MULTI	

RESISTOR

Ref.No	Part No.	Description	Remark
R100	1-249-422-11	CARBON 2.7K 5% 1/4W	

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*1-627-677-11 V BOARD
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Ref.No	Part No.	Description	Remark
	1-563-265-11	CONNECTOR, MULTIPLE 10P	

RESISTOR

Ref.No	Part No.	Description	Remark
R1	1-249-405-11	CARBON 100 5% 1/4W	
R2	1-249-405-11	CARBON 100 5% 1/4W	
R3	1-249-405-11	CARBON 100 5% 1/4W	
R4	1-249-405-11	CARBON 100 5% 1/4W	
R5	1-249-405-11	CARBON 100 5% 1/4W	
R6	1-249-405-11	CARBON 100 5% 1/4W	
R7	1-249-405-11	CARBON 100 5% 1/4W	

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*1-627-678-11 W BOARD
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CAPACITOR

Ref.No	Part No.	Description	Remark
C1	1-108-692-11	MYLAR 0.01MF 10% 200V	
C2	1-108-692-11	MYLAR 0.01MF 10% 200V	

RESISTOR

Ref.No	Part No.	Description	Remark
R1	1-214-702-00	METAL 75 1% 1/4W	
R2	1-214-702-00	METAL 75 1% 1/4W	
R3	1-214-702-00	METAL 75 1% 1/4W	

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*1-631-680-11 XB BOARD
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DIODE

Ref.No	Part No.	Description	Remark
D1	8-719-901-49	DIODE LT-9010H	
D2	8-719-901-49	DIODE LT-9010H	

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*1-631-679-11 Y BOARD
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DIODE

Ref.No	Part No.	Description	Remark
D1	8-719-812-43	DIODE TLG124A	

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MISCELLANEOUS
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Ref.No	Part No.	Description	Remark
	⚠1-237-165-12	RESISTOR ASSY, HIGH-VOLTAGE	
	⚠1-238-301-12	RESISTOR ASSY, HIGH-VOLTAGE	
	⚠1-426-460-11	COIL, DEMAGNETIZATION	
	⚠1-451-349-21	DEFLECTION YOKE (Y20FZA)	
	⚠1-452-337-22	NECK ASSY, CRT (NA304)	
	⚠1-532-203-11	FUSE, TIME-LAG 2A/250V (BVM-2015P ONLY)	
	⚠1-532-746-11	FUSE, GLASS TUBE 4A/125V (BVM-1915, 2015PM ONLY)	
	1-565-791-11	CONNECTOR, BNC 1P	
S901	⚠1-571-877-11	SWITCH, PUSH (AC POWER)	
V901	⚠8-736-121-05	PICTURE TUBE (M49KGH21X)(BVM-2015P/PM ONLY)	
V901	⚠8-736-123-05	PICTURE TUBE (M49KGH20X)(BVM-1915 ONLY)	

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Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

ACCESSORIES & PACKING MATERIALS

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Ref.No	Part No.	Description	Remark
	⚠1-532-203-11	FUSE, TIME-LAG 2A/250V	
	⚠1-532-746-11	FUSE, GLASS TUBE 4A/125V	
	⚠1-590-150-11	CORD, POWER (BVM-2015P ONLY)	
	⚠1-551-812-11	CORD, POWER (BVM-1915, 2015PM ONLY)	
	1-560-776-00	SOCKET, CONNECTOR 10P	
	*1-561-337-21	CONNECTOR, MULTI	
	*1-627-687-11	Z BOARD (EXTENSION BOARD)	
	2-990-242-01	HOLDER (B), PLUG	
	*4-361-988-02	BAG, PROTECTION	
	4-378-901-01	KEY	
	4-386-841-01	LABEL, TALLY NUMBER	
	4-386-841-11	LABEL, TALLY NUMBER	
	*4-386-858-01	CUSHION (UPPER)	
	*4-386-875-01	CUSHION (FRONT LOWER)	
	*4-386-876-01	CUSHION (REAR LOWER)	
	*4-391-230-01	INDIVIDUAL CARTON (BVM-2015P/PM ONLY)	
	4-391-231-11	MANUAL, OPERATION & MAINTENANCE	
	*4-391-252-01	INDIVIDUAL CARTON (BVM-1915 ONLY)	
	7-700-731-03	DRIVER, VR AJUSTMENT	